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Our Home Physician

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OUR

HOME PHYSICIAN:

A NEW AND POPULAR GUIDE

TO THE

ART OF PRESERVING HEALTH AND TREATING DISEASE;

WITH PLAIN ADVICE FOR ALL THE

MEDICAL AND SURGICAL EMERGENCIES OF THE FAMILY.

CONTAINING CLEAR DESCRIPTIONS OF THE

Structure and Functions of the Human Body; the Influence of Occupation on Health and Longevity; the laws of Inheritance; with new and original chapters on Diet, Stimulants and Narcotics, Air, Sunlight, Exercise, Climate, Electricity, and Nervous Diseases of modern times; and full directions for the care of the Sick, and the management of Infants and Children; with a general description of recent Medical Discoveries and Improvements; plain suggestions for the Treatment of Diseases adapted to the wants of the Household, and for those who, like Miners, Sailors, Planters, and dwellers in remote districts, are beyond the ready call of a Physician.

BASED ON THE MOST RECENT AND THE HIGHEST AUTHORITIES IN THE SEVERAL DEPARTMENTS, AND BROUGHT DOWN TO THE LATEST DATES.

By GEORGE M. BEARD, A.M., M.D.,

Lecturer on Nervous Diseases in the University of New York; Fellow of the New York Academy of Medicine; Member of the New York County Medical Society; one of the Authors of "The Medical Use of Electricity," &c.

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PREFACE.

THE objects of this book are:

1. *To prevent disease*, by presenting in a popular form information concerning the laws of health.

2. *To shorten disease*, by enforcing the necessity and the duty of taking bad symptoms in time, and stopping the beginnings of evil.

3. *To diminish the evil and fatal effects of disease*, by giving plain advice for all the medical and surgical emergencies of the family, and simple rules for arresting and controlling disease for those who are beyond the ready call of a physician. Its purpose, therefore, is not so much to enable its readers to dispense with a *physician*, as to teach them how to dispense with *disease*.

4. *To give popular information concerning the progress of medical science*, by briefly describing and illustrating the recent inventions, discoveries, and improvements by means of which physicians are now enabled to study and to treat disease so much more satisfactorily and successfully than in former times. Although many of the instruments and appliances that are represented cannot, of course, be used by my readers, and may indeed never be seen by them, yet a general knowledge of their nature and uses cannot fail to be both interesting and valuable to the afflicted of every class, and should have the effect to convince the most sceptical that a profession which has done so much and so nobly for humanity is worthy of the highest respect and most fervent gratitude.

What is here said concerning the structure of the human body and the functions of its organs; on diet, stimulants, narcotics, air, sunlight, exercise, bathing; on the care of the sick-room, the management of infants and children; on the general laws and history of disease; and on the treatment of accidents and emergencies, and descriptions of familiar remedies,—is *designed for all persons and for every household.*

What is here said concerning the special care and treatment of obscure and grave diseases, and the application of powerful remedies, is designed chiefly for those who, like planters, miners, sailors, travellers, and dwellers in remote districts and on the plains,

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are beyond the reach of skilful medical aid, and must either be treated by themselves or by their friends, or left to suffer, and perhaps to die.

The work, as now arranged, *not only includes all that has ever been attempted in similar works*, but also *several hundred new subjects in the department of health that have never before been mentioned in any or all of the popular treatises on medical science that have yet appeared.* I have sought to mention and describe every *recent medical discovery and improvement that can possibly be of any service to my readers.* I have endeavored throughout the work to keep in mind that I was writing for the great masses of the people, who know little or nothing of medical language. Therefore I have aimed to make the descriptions brief, clear, and elementary. There are many methods of studying disease, many hard terms which would only bewilder the general reader, though they are very familiar to physicians. Of such I make no mention.

My aim has also been to make the work so clear that the wayfaring man might not err therein, and yet so thorough and exhaustive that the educated physician should find in it much to perfect his knowledge and refresh his memory.

It will be seen that the types, phases, and names of diseases have changed wonderfully during the past twenty-five years. We now have less of fevers and inflammation, and more of dyspepsia, neuralgia, hysteria, hypochondria, and other forms of nervous disease.

In our method of treatment, a greater revolution has been wrought than in the types of disease. Instead of bleeding and calomel, tartar-emetic and low diet, we now give *tonics and stimulants—iron and quinine, strychnine and arsenic, cod-liver oil and whiskey, air and sunlight, passive movements, general electrization, abundance of sleep, and a large and palatable variety of nourishing food.*

The result of all this scientific progress is, that we are much more successful in the treatment of diseases than formerly. Consumption is now much oftener held in check, relieved, and cured than it was twenty-five years ago. Statistics now show that it is much less frequently fatal under the new system of treatment than under the old. *Catarrh* of the nose and larynx (rhinitis, pharyngitis, and laryngitis), *dyspepsia*, *neuralgia*, *hysteria*, *hypochondria*, *insanity*, *the special diseases of women*, *affections of the eye*, *the ear*, *and the skin*—all of which were until recently ignored and neglected by the profession—are now treated with signal success. Among the new remedies and methods of treatment that have been found most successful, I may here mention *bromide of potassium*, *carbolic acid*, *the sulphites and hypophosphites of soda*, *pepsin*, *cod-liver oil*, *strychnine*, *Swedish movements*, *general and localized electrization*, *podophyllin*, *pyrophosphate of iron*, *veratrum viride*, *nitrous oxide*, *oxygen*, *phosphorus*, *glycerine*, *chlorate of potash*.

This work is intended to be a *compend of the whole of the popular medical science of our time*, so far as it can be interesting or useful to my readers. Under Anatomy I have presented those general facts in regard to the structure of the body, that every one, young and old, should be acquainted with. Under Physiology I have introduced many recent experiments and researches in this most fascinating branch of science. Under Hygiene I have given in detail important rules for the care of the health and the art of prolonging life. This is a subject to which I have devoted my life, and one to which I call the special attention of my readers. The large portion of the book devoted to the care of the health will be found to contain new, reliable, and interesting facts, many of which have never before been published. The facts and views that I present on the subject of *Food*, *Stimulants and Narcotics*, *Exercise*, *Sleep*, *Laws of Inheritance*, *Influence of Occupation on Health and Longevity*, *Man compared with other Animals*, certain of the nervous diseases, will probably take most of my readers by surprise. This surprise will be all the greater because the people have usually obtained their instruction on these matters from bad or ignorant men, who knew nothing whatever of science. I have tried also to present this department of hygiene in a somewhat attractive and interesting style, so that every one into whose hands the book may fall will read them *first*, even though all other sections are neglected.

In speaking of the various Accidents, Diseases, and Remedies, I have aimed to be brief, clear, direct, and explicit; to introduce nothing that would mislead, to omit nothing that can be of practical service to any one. I have tried to draw the lines beyond which patients should never attempt to cross. I have pointed out those conditions in which patients should never allow themselves to be treated by themselves or their friends, and should consult the best medical advice or none at all.

It will be seen that a large number of diseases which the masses of the people suppose to be incurable are now, under our modern systems of treatment and in skilful hands, susceptible of relief and of cure. All over the land there are thousands of cases of cataract that a skilful oculist might operate on with success; thousands of cases of deafness which, if taken in time, might be wholly or partially cured; thousands of cases of dyspepsia, neuralgia, paralysis, and other nameless forms of chronic nervous diseases, that, if they only knew where to go, without falling into the hands of the philistines, might be permanently relieved. All about us there are aching heads, weary nerves, that cry bitterly for relief and know not where to find it. This knowledge of the best way to consult a physician, and the best means of treatment, especially for diseases that have been regarded as incurable, I endeavor here to supply.

There are yet among the people those who have a blind faith in some one school or exclusive system of treatment. *To all such, let me say that the wise physician of our time uses for his patients all things that have been proved to be beneficial. On this principle* this work is based. The best physicians of our day are not narrow or bigoted, as some suppose, but are on the whole more liberal and progressive than almost any other class in society.

I undertake the enterprise with a full appreciation of the responsibilities of my position as a pioneer. Accordingly, I have left no stone unturned to make the work fully represent the best and most recent opinions and experience of the leading authorities of our time in the various departments.

This book, as now completed, is the work of so many hands, that I might perhaps be more properly called its editor than its author. Of the "*Domestic Medicine*" prepared by Imray and other able writers, on which the work is based, I have taken of the general descriptions, especially in the department of Anatomy, such portions as in their very nature cannot be very progressive, and are therefore of permanent application.

I have been assisted in the department of the *Eye and Ear*, by Prof. D. B. St. John Roosa; in *Surgical Accidents and Emergencies*, by Prof. Benjamin Howard; in *Obstetrics and the Diseases of Women*, by Dr. James B. Hunter. In the general revision of the work and correction of the proofs I have received indispensable assistance from my professional associate, Dr. A. D. Rockwell.

In collecting *Vital Statistics* I have at various times received invaluable suggestions from those eminent hygienists, Dr. Edward Jarvis and Dr. Elisha Harris, Registrar of Vital Statistics of the New York Metropolitan Board of Health.

In the *sanitary department* I have had the benefit of the experience of the well-known sanitarian, Dr. John H. Griscom.

To each and all of these gentlemen I desire to express my warmest acknowledgments, not alone for special assistance, but for general encouragement in my labors.

I have quoted extensively from my translation of *Tobold's Chronic Diseases of the Larynx*, from my works on *The Brain and*

Brain-Workers, and *Hygiene for Students*, both of which are now being prepared for early publication; and also from a work on *General and Localized Electrization*, by Dr. A. D. Rockwell and myself, which is now in press. To Messrs. Tiemann & Co. my thanks are due for courtesy and promptness in furnishing a number of the cuts of instruments with which the work is illustrated.

I have consulted and freely quoted the standard works in the special departments of medical science that have appeared during the last few years. A partial list of the more prominent of these writers, with the titles of their books, will be found under a separate heading.

The task which I have here undertaken is one of unusual difficulty and delicacy. To prepare a comprehensive popular treatise on the recondite science of medicine that shall say just enough to instruct, and not so much as to bewilder; that shall fairly represent the various departments in language both clear and attractive, as well as accurate and instructive; that shall make broad and plain the boundaries between those subjects which the people can and should know, and those which they should not attempt to know; that shall treat all this large variety of themes in such manner as not to offend the taste of the best-ordered household,—this is probably the severest test to which a scientific writer can possibly be brought.

In the absence of any respectable model, I have been compelled to proceed without guide or precedent, and to create my own ideal. Accordingly, it has been my aim to write here in the pages of this book just what I say every day in my office to my patients; just what I have been accustomed to teach in my popular essays and in my lectures before schools and lyceums.

I say just what the family physician would tell his patients if he had the time and strength to give instruction in science to the families under his charge.

G. M. B.

INTRODUCTION.

I.

REASONS WHY ALL PEOPLE SHOULD HAVE SOME GENERAL KNOWLEDGE OF MEDICAL SCIENCE.

It is one of the most cheering signs of our times that *science* is being diffused among the masses of the people.

On every hand we see evidences of an increasing love for scientific truth, even among those classes who formerly had no love for knowledge of any kind. Works on familiar science are now read with considerable eagerness; and the certain prospect is, that in a few years they will command a much wider circle of readers than they do at the present time.

The people are beginning to learn that science is for them and not for the few, and are now informing themselves of some of the general principles and facts of astronomy, of geology, and of chemistry; and our periodical literature is helping on the good work, oftentimes unconsciously. It is hard to find any prominent and popular newspaper or magazine that does not now and then present some interesting and valuable scientific facts and theories; and there are quite a number of journals which regularly devote a certain space to popular science in all its branches—chemistry, astronomy, geology, and medicine.

Nor is this all. Quite recently a journal has been established, one of the professed objects of which is to disseminate popular science among those classes who are the most eager readers of fiction.

These signs of the times are, I say, full of cheer. They give promise of a more generous culture, larger views, and more kindly tolerance in the future, among all ranks of society; for the tendency of scientific knowledge is always to liberalize.

The one great cause of the prevailing (but happily diminishing) narrowness in our current theologies, systems of education, and social customs, is *ignorance*. Ignorance begets prejudice, and for the poison of prejudice the only antidote is *knowledge*.

While, then, bidding God-speed to all who, like Agassiz, and

Huxley, and Youmans, and others, are endeavoring to popularize natural science, I desire here to make a special plea for the popular study of the *Human Body in health and disease.*

There are reasons why, especially at the present time, every one should make it a pleasure and a duty to become acquainted with some of the general facts in regard to the structure and functions of the human system, as well as the rules for preserving health, and checking or modifying disease.

These reasons are:—

1. *Because the human body* is the greatest *wonder of creation.* Nothing that man can devise, and nothing else that God has created, is worthy to be compared with the complex, wonderful machine which we call *man.*

A distinguished theologian truly and eloquently says: "Men will cross the ocean to see a mountain or a waterfall, but there is more of grandeur in the human spirit than in all material nature."

Now the human spirit is manifested through the material organization—the body; it therefore becomes necessary that we should study the structure and functions of this body before we can well and truly understand the spirit of which it is the agent. The human brain, through which the soul is manifested, is a far more wonderful object than the loftiest mountain or the broadest ocean. It is true that the gigantic and imposing objects of nature,—mountains and oceans, forests and cataracts,—appeal more directly to the uneducated senses than do those objects which are comparatively minute and insignificant.

The element of size, the grandeur of immensity, the awfulness of height and depth, of length and breadth, can be much better appreciated by the great mass of unthinking and unreasoning humanity than objects which, though far more wonderful and suggestive, are yet less imposing and pretentious. Humanity the world over is more impressed by quantity than by quality. In proportion, however, as men advance in knowledge, in proportion as reason obtains supremacy over imagination, in that proportion will men cease to be impressed by mere size and quantity, and will learn to appreciate the beauty and grandeur of nature as revealed in objects that to the untaught mind would not only not be impressive, but would actually be revolting.

There are those who feel that the study of material substance is undignified and disagreeable. They declare that the study of anatomy suggests the dissecting-room, that the reading of hygiene tends to hypochondriasis, and that all discourses of medicine bring up horrid images of the hospital and sick-room. To all such objections I reply that knowledge itself is dignity, and in turn dignifies and ennobles that which to the untutored senses is insignificant and revolting. The human body is always small and insignificant in comparison with thousands of other created objects, animate and inanimate, and only in exceptional cases is it attractive or beautiful to the eye; and yet it is the most wonderful and suggestive of all.

The brain is but a small portion of the human body: its yielding and sightless mass can readily be held in the hollow of the hand; but in comparison with it all other wonderful objects of nature sink into insignificance. Place but a minute section of that brain beneath the microscope, and what before, to the unaided vision, was as simple in its structure as a formless mass of clay, reveals itself as a vast congeries of cells, group after group, layer on layer, of every variety of shape, infinite in their number, infinite in their communications, and infinite, too, as we may suppose, in their functions. Subject a fragment of that brain to the tests of chemistry, and we learn that the elements of which it is composed are substantially similar to those out of which are developed thousands of organized products of nature; and thence we are forced to infer that the vast superiority in function and capacity over all other created objects must be due solely or chiefly to some subtle and mysterious difference of molecular arrangement, which neither the microscope nor chemistry have yet been able to fathom.

2. *A general knowledge of medical science will aid us in preserving health and prolonging life, and thus will add much to our usefulness and happiness.*

The great art in medical science is not so much to cure disease as to prevent it. The great progress that medicine has made in recent times is shown not so much in the actual treatment of disease—although here also we are far more successful than formerly—as in forestalling and preventing it by obedience to the laws of health and wholesome sanitary reform.

For all that we are, and for all that we do in life, we are dependent on the body. The difference between one man and another is the difference in quantity and quality of bodily formation; for the soul manifests itself through the brain, which is an organ of the body, and is as much dependent on the brain for the character of its manifestations as the digestion is dependent on the apparatus of digestion.

Strictly speaking, there can probably be no such thing as a disease of the mind without a corresponding disease of some part of the body, and usually of the brain, which is the organ of the mind. In view of this consideration we see that it becomes a high and solemn duty for every one to obtain some general knowledge of the human system in health and disease, in order to guard against evil, to ward off injury, to intensify and prolong existence.

It should be remembered that every evil that is experienced by the human system, every pain, every sorrow, every disease, comes by the operations of the great law of cause and effect. Nothing evil or good comes to us by chance. Contagions, epidemics, malarias, the myriad forms of nervous disease, the subtle and saddening phases of insanity and delirium—all these myriad woes of the human races are dependent on definite causes, many of which may be guarded against by those who have the requisite knowledge.

A general knowledge of medical science will help us to fulfil more intelligently and successfully our various duties as members of society.

Science must not be confined to scientific men. A knowledge of science in its various departments, and especially a general knowledge of the structure and operations of the human body and of some of the laws of disease, will make us better lawyers, better clergymen, better merchants, better farmers, better laborers, better mechanics and artisans, better wives and mothers and husbands and fathers, better citizens, and better in every condition and relation of society.

The habit of studying and reading on science is important, not only for the facts that we learn, but on account of the habit which we thereby form of looking at questions from a scientific point of view. We are all of us too much inclined to form our opinions from prejudice, and from a general impression, without regard to truth or facts. The consequence is that society is filled with error. The consequence is, that even in this enlightened age and throughout this enlightened country, the opinions of masses of people on nearly every important subject are more or less erroneous. On nearly every page of this present work I have been obliged to refute some deeply-rooted, widely-spread error concerning diet, or stimulants and narcotics, or sleep, or exercise, or some form of disease. Erroneous views on medical science confront the physician wherever he turns—in the street, in the store, at public assemblies, in the halls of legislatures and chambers of justice, in the periodical literature and in our standard works of genius, in every family, and by every bedside.

These are not the results of ignorance alone. They are the results of a *deficiency in the scientific spirit*, and an excess of dogmatic prejudices in society.

The *scientific spirit* differs from the dogmatic spirit in these respects:

First. In the pursuit of truth it endeavors to dismiss all prejudice, all preconceived impressions. It has no theories to prove and no wishes to gratify, except the love of truth.

Secondly. It never ASSUMES *that anything is true until it is proved to be true; and always holds itself ready and willing to change any views, however dear or long-cherished, as soon as they are proved to be erroneous.*

Thirdly. When it has found the truth on any subject, after careful and patient balancing of all the facts that bear upon it, it eagerly embraces and proclaims that truth, without ever asking for an instant whether its apparent tendencies may be good or evil.

The great want of our country at the present time is a wider diffusion of this scientific spirit, so that men will form their opinions, especially on social and political topics, less by their hopes and desires, expectations and fears, and more by the *facts.*

When I write on the ignorance of the country on matters of science, I know not where to begin or where to end. This ignorance is not confined to the lower classes; it is even more prominently observed and far more injuriously felt among the educated and influential. In our country this scientific ignorance is especially to be deplored, because here all men are created free and equal, all have equal voice in the administration of government, and all have equal chance to rise to positions of honor and influence. Our present social, legislative, and judicial systems are so defective, that men who know nothing whatever of science are continually called upon to decide important scientific questions affecting the rights, the privileges, and the duties of those who, perhaps, know far more than they, not only of science, but of every other department of thought.

Legislatures, not one of whose members can answer the simplest fundamental question concerning the nature or the history of stimulants and narcotics, who do not know and have not thought to inquire whether they came chiefly into use fifteen hundred years before Christ or fifteen hundred after, are yet every year called upon to enact laws to prohibit or regulate their use in society. Is it surprising that their legislation is so absurd and inconsistent? Judges and juries, who have not the faintest conception whether insanity is a symptom of disease of the brain or of the liver—who in all their lives have never given five minutes of consecutive thought to any scientific subject whatever—are compelled, under our present system of laws, to decide on this momentous question of sanity or insanity, not only in cases of life and death, but also in cases where property even, so much more valued than life, is at stake. Is it surprising that the wicked so often escape and the irresponsible are so often punished?

Clergymen, editors, and public teachers, who know all subjects better than they know the science of life, are expected and required to pronounce upon the right or wrong of questions which do not and should not rise into the sphere of morals until they have first been determined in the sphere of experience. Is it surprising that even our most conscientious public instructors must sometimes put darkness for light and light for darkness on many of these important themes?

Parents and guardians, who have never themselves been properly taught concerning the structure or the functions of the human body, are obliged to train up their children to the same dogmas and prejudices and erroneous impressions by which they themselves have been inspired. Is it surprising that our children grow up in error? Would it not indeed be still more surprising if they possessed any true or real knowledge on any question of hygienic or medical science?

The truth is, that there is scarcely any important social, political, or religious question of our time that may not be aided in its solution by a knowledge of the leading principles of medical science. The rights and duties of women, the status of the Africans, the future of the Chinese, and many other analogous questions of minor importance, would be solved much more readily and more correctly if philanthropy would not so blindly refuse the aid of physiology. But, unfortunately for the cause of truth, only those who have at least some general knowledge of medical science, or who have enjoyed some training in that department, are willing to listen to arguments based on the facts of science, especially when they militate against their prejudices and desires. Prof. Goldwin Smith, in his masterly address on education recently delivered at Albany, said that the voice of physiology should be heard on this great question of the education of woman; but until the people, both the leaders and the masses, are educated into a scientific spirit, the efforts of physiology will be vain. Though she cry aloud in every language and on every corner of the street, yet her speech will be in an unknown tongue, and her voice will be drowned in the jeers and groans of the multitude.

It cannot be denied that even at the present time there exists a deeply-seated prejudice against scientific men. They are regarded as the enemies of truth, although their professed object is the pursuit of truth. They are branded with meaningless but repulsive epithets,—materialists, infidels, atheists,—and are held up before the people as solemn and impressive warnings. The cure for this unfortunate prejudice lies in the general diffusion of scientific knowledge.

4. *The study of the principles and facts of medical science is exceedingly pleasurable.*

If the pursuit of knowledge is the highest and most enduring pleasure of life, the study of science is the most enjoyable department of knowledge.

The calm and unworried pursuit of science is probably the purest and most enduring intellectual pleasure of which human nature is capable. It is also exceedingly conducive to health. As will be shown in my essay on the Influence of Occupations on Health and Longevity, philosophers and men of science attain a great average longevity.

Children should be instructed in the interesting and important departments of physiology and hygiene, not only at school, but in the family circle. It is not right nor necessary that the study of these subjects should be made dry and dismal. By the aid of maps, charts, pictures, attractive books, and especially by the exercise of kindly care on the part of instructors, these theories can be made not only instructive but actually fascinating. The commandments of physiology and hygiene should be taught diligently unto our children, line upon line, precept upon precept, here a little and there a little, in the house and by the way, at their lying down and their rising up. Much of the scientific instruction given to children in early life will not be fully understood in all its transcendent importance until after years; but in time of need they will both remember and appreciate its value.

They will remember it when they rise to positions of responsibility and posts of honor, and will guide their judgment and inspire their lives by its teachings. They will remember it in the hour of temptation, and will derive therefrom wisdom to direct and strength to resist the force of mastering passions. They will remember it in the time of darkness and sorrow, and will rejoice in the light of its truths, and find the rarest of consolation in the activity of its pursuit. They will remember it when they themselves are parents, and in turn will teach it to their children, and they again to their children's children, unto the remotest generations.

II.

REASONS WHY THE PROFESSION SHOULD LABOR TO DIFFUSE A GENERAL KNOWLEDGE OF MEDICAL SCIENCE AMONG THE PEOPLE.

THE duty of the profession to diffuse a knowledge of medical science among the people is rendered imperative by these *four* considerations:

1. *Because all people everywhere need, and should have, some general knowledge of the human body in health and disease.*

The time has gone by when it was thought to be necessary that learning should be confined to the few. It is the glory of our century that knowledge of all kinds is diffused among the masses of the people. The time was when theology was confined to the clergy, and was the privilege of monks and cloisters; religion is now the duty and the joy of the ignorant and the lowly. The time was when all government and law were in the hands of a few aristocrats, and even of some single monarch; in our day and country the people rule, and kings and queens, presidents and senators, are but their servants.

Science must now follow in the wake of theology and government. If the masses of the people are to have all the power in Church and State, they certainly must not be left in ignorance. For the ignorance of humanity there is only one antidote, and that is knowledge. Of all departments of knowledge, none is so important as that of ourselves. It is impossible to know ourselves without knowing the structure of the human body, the functions of its organs, and the laws of health. It is impossible to acquire this knowledge without careful study, diligent reading and patient repetition, in all the recognized methods of imparting knowledge. It must be taught to children in the school and by the domestic fireside, and in juvenile literature. It must be taught to parents from the pulpit, the platform, and in the periodical press, and in such works as these.

The present ignorance of society in regard to anatomy, physiology, and the laws of health is truly appalling. Even the clergy, who are so advanced in general culture, and who should be the teachers of hygiene as a part of morality, are as a profession utterly in the dark in regard to the simplest laws of life and health. Theologians and professors, college presidents and pulpit orators, who have learned all important languages, living and dead, who can repeat at call the names of all the imbecile and insane kings of Europe and the dates of their administrations, do not even suspect the nature of the processes of respiration or of digestion every moment going on in their own bodies; and even give no reason for the faith that is in them, that the brain rather than the liver is the organ of the mind.

Even men of general science, who plan great inventions and understand all the machinery of man's devising, know nothing of the most wonderful machine of all—the human body. If these things be done in the green tree, what shall be done in the dry? If our teachers, and the teachers of our teachers, know little or nothing of themselves, what shall we say of the great masses of the people? What shall we say of the millions of farmers, mechanics, laborers, and the solid yeomanry of our land, on whose virtue and intelligence the welfare of the republic must ever depend?

The profession must exert its influence to introduce the systematic study of hygienic science in all of our colleges and institutions of learning.

Time was when the standard of scholarship was necessarily estimated by the extent of one's familiarity with dead languages; when the span of a thousand years—the dark ages of humanity—intervened between the scholar in the cloister and the literary wealth of the world; when, in short, the student was forced to choose between treasuring up the learning of ancient times, and knowing nothing at all.

That necessity has long since gone by, but the system of instruction to which it gave rise in its leading features lives to-day Bacon never uttered a profounder or more beautiful thought than when he said that what is called the antiquity of the world is really its youth. If the ancients could be alive again to-day, they surely would be the first to bow at the feet of the nineteenth century.

When we consider the marvellous scientific progress of the last century—that within that time Geology has arisen out of the darkness of conjecture and has developed into a more comprehensive and enduring science; and that by the discovery of hydrogen by Cavendish, of oxygen by Priestley, of nitrogen by Rutherford, and by the labors of Sir Humphry Davy, Liebig, and their followers, the science of chemistry has been as it were created, and all since the year 1766; that within less than this time that universal agent, Electricity, has revealed itself to man in its effects if not in its nature,—has indeed deigned to serve him as his fleetest messenger through the air and under the sea, as the faithful and rapid copyist of works of art, as a powerful means of illumination, and as a most effective healer in disease; that within the last fifty years the mechanic arts, in their myriad ramifications, have made more effective progress than other eras have witnessed in twice as many decades; when we consider that astronomy, the most ancient of sciences, the boast of the Egyptians and Chaldeans—which is indeed in its very essence a study of centuries—has not been without its refinements even during the present generation—nay, even within the year that is just passed; when, I say, we thus consider all that the last fifty years has done for science,—and more than all, when we contemplate the wondrous possibilities of the fifty years to come, and for which we now have but laid the foundation; and when, on the other hand, we consider how little these branches are taught or even suggested to our undergraduates, we can but wonder that an age which has revolutionized society by its activity in science, has made so little impression on those institutions that ought to be, if they are not, the centres and the repositories of the world's progress.

It is neither necessary nor desirable that hygienic or other science should supplant the languages. It is the duty of the profession, however, to see that in all our institutions of learning it is placed on the *same footing as all other important departments;* that it receives something more than a merely incidental and superficial attention; and that it is made *equally binding with all other recognized studies of the course.*

2. *Because physicians are the only class who are authorities in medical science, and who are qualified to give instruction in it.*

Medical science is a large subject, and it takes a lifetime to comprehend it. People look to those whose lives are devoted to this subject to teach them what they ought to know. They have a right to do so. Of those to whom much has been given, much will be required. If we know that which will be of service to our fellows, we have no right to keep it to ourselves alone. A miser of knowledge is even more censurable than a miser of money, because he is more intelligent, and therefore more responsible. It is even more wrong for us to hoard knowledge than to hoard specie, for knowledge is more valuable than gold or silver or precious stones.

Until quite recently the clergy have been the chief instructors of the people in medical science; but they have unfortunately taught more of error than of truth. The fault, however, is not with the clergy but with the physicians. The clergyman must first be himself instructed before he can instruct others. The duty of teaching medical science to the clergy devolves upon the physician, because in all such matters he is the first authority and last appeal. It is right and proper and noble for the pastor to teach his flock the laws of health, and to enjoin their observance as a high moral duty; but he must know whereof he affirms, and the true knowledge on these themes he must learn from the physician.

3. *Because the instruction of the people in medical science has been almost entirely in the hands of ignorant and unprincipled charlatans.*

This lamentable and well-known fact, which ought long since to have aroused the profession to its great duty, seems to have had the opposite effect, and has deterred them from attempting any systematic instruction of the people. There are those even now who fear to write or lecture for the masses, lest they may thereby become classed with the ignorant and villanous quacks who in this country have appropriated this department almost entirely to themselves. I hold to a very different doctrine. I hold that the example of charlatans, so far from discouraging, should rather stimulate the profession to follow after them and drive them off the track. It is because the enemy have planted tares in the field, that we should enter in and sow the good seed. It is because the philistines have already invaded the land, that we should hasten to take possession.

The noblest and best part of our mission is not to cure disease, but to prevent it. The true and only way to prevent disease is to diffuse through all ranks of society a general knowledge of the human body and of the laws of health.

There may be those who fear lest the profession may lose its dignity by coming down from its lofty eminence and feeding the hungry multitude. In the infancy of science, in the darkness of the middle ages, such fear was, perhaps, not unnatural; but the time for that has now long gone by. When the sun is rising it gilds only the higher mountain tops; when it mounts to noonday it sends its rays, bright, warm, and abundant, into the depths of the valleys and the darkest crevices of the rocks. Just so when science was first rising upon the world, its light was only seen and its warmth only felt by the philosopher, the recluse; as it is now ascending higher in the sky, it should shine, with wisdom and healing in its beams, on the walks of the humble, the lowly, and the sorrowing.

Science is no more degraded by ministering to the wants of the people than is the sunlight when it trails its beams along the valleys, or the rain when it falls alike on the evil and the good.

Jean Paul Richter has somewhere presented in substance this simile, which the disciple of science should ever bear in mind. "Beautiful is the eagle when it soars aloft in the sky and plumes its distant flight towards the sun, but more beautiful still when it descends to the earth and brings food to its helpless offspring in their nest; so the philosopher is noble when he lives above the world in the cold atmosphere of science, but nobler still when he descends from his lofty heights and brings hope and comfort to the suffering sons of men."

4. *Because the profession will elevate and benefit itself by thus instructing the people in medical science.*

All physicians the world over will agree that ignorant people make the worst patients. The lower classes are proverbially exacting and unreasonable, and too often unappreciative. In proportion as people are educated—and especially in science—in that proportion do they become considerate towards their physician, obedient to his orders, and grateful for his services.

The effect of the popularization of medical science will be not to diminish the practice of the profession, but to increase it. Patients are deterred from consulting educated physicians, not by knowledge but by ignorance; not by their ability to prevent or treat diseases, but their inability to distinguish between those conditions which are beyond all hope, and those which in scientific hands are both relievable and curable.

When the people are educated to a full understanding of the wonderful achievements of science in the past, and the vast progress that it is making in the present, and the wide distinction between the physician and the quack, then will they know—what the masses of our country have yet to learn—that the educated members of the profession are not the enemies but the friends of advancement, and that on the average they are as much more successful than the charlatans, as they are more scholarly and more honest.

It is only by a general diffusion of popular science that the vast army of charlatans—that are now working such ruinous havoc in the best ranks of society—can be successfully combated and dispersed. The scientific man is pained to his heart's core when he sees—as every day he is compelled to see—the best educated and finest cultured minds of the country—our leaders in literary, professional, and business life—ruined in health and in purse by the vilest quacks that ever disgraced any age or country. The quackery of our day feeds and fattens on the ignorance of the learned. It derives its rich support from the fact that the people know all other things better than they know science. The scientific physician who long gazes upon this great rush of humanity after quack doctors, quack books, quack medicines—after all forms of error and one-sided "pathies" and "isms," feels much like the philanthropist who, from the bank of a mighty stream, sees his fellow-beings hurried along in the flood and ingulfed in the whirlpool, while he is powerless to save.

Salvation from quackery will only come from popular instruction.

Besides all this, it is the duty of the profession, through the popularization of science, to make itself a *power in society*.

It is our duty in this way to make our influence more widely felt as a ruling force through all the departments of modern activity.

For all these reasons we hail with joy the recent endeavors of some of our leading physicians to popularize medical science. The system of lectures on science lately attempted by Professors Huxley and Carpenter in London; the noble example of Professors Willard Parker and E. R. Peaslee in New York; the recently published essays of Bowditch, Jarvis, Allen, Youmans, Hammond, Flint, Mitchell, Griscom, Peters, Roosa, Harris, Byford, and other leading authorities in our profession; and the magnificent and successful treatise of our eminent countryman, Prof. John C. Dalton—all these are the emphatic protests on the part of the profession that the people shall no longer dwell in darkness, that the medieval age of narrow and selfish exclusiveness has passed away, and that men of science shall hereafter follow in the path of theologians and lawgivers, and sow the good seed of truth broadcast through society.

In order to popularize science it is not enough to provide textbooks for the young. We must sow beside all waters. We must make the magazines, the daily and weekly press, the platform, the lecture hall, the organizations of philanthropy, the pulpit and the Sabbath-school, channels of communication, through which knowledge of science shall flow to the uttermost corners of the earth.

EXPLANATIONS AND SUGGESTIONS FOR THE READER.

1. In order to get information on any subject treated of in this book, *look in the index.*

Although the departments of Anatomy, Physiology, Hygiene, Description of the Principal Diseases and Remedies (alphabetically arranged), Prescriptions and List of Medicines are so arranged that one who is familiar with the book can tell at once where to look for information on any particular theme, yet the surest and easiest way is *to consult the index at once.*

2. The subjects of Physiology, Diet, Sleep, Air, Sunlight, Exercise, Stimulants and Narcotics, Influence of Occupation on Health and Longevity, Laws of Inheritance, Influence of Climate, Management of Infancy, and many of the principal diseases, are so treated that they can be read with interest and studied with profit, as well as merely referred to.

3. *The doses of the medicines prescribed in this book are designed for adults.* The rule for graduating the dose for children, according to the *age*, is given on page 460.

When any remedy is recommended for the treatment of any disease, the dose is not usually given, because it must necessarily vary with the *age of the patient.* The way to ascertain the dose in all such cases is to refer to the description of the remedy itself, which can be found in the index. In those exceptional cases where the dose is given it is designed for adults, unless specially ordered otherwise.

4. Under the treatment of the diseases, I have given *principles* of treatment rather than minute and bewildering details. The tendency with patients is almost always to give too much medicine, and to give it in too large doses. It will be observed that the treatment recommended, even for the most serious diseases, is frequently quite simple—consisting chiefly in good nursing, refreshing drinks, thorough ventilation, and the cautious administration of perhaps one or two medicines.

Those who have been accustomed to indiscriminate dosing with great combinations of drugs, will no doubt be surprised, on consulting this book, to find even some of the most terrible diseases are treated by a *few remedies and by simple prescriptions.*

It has been found in recent times, that, with some exceptions, simple prescriptions, containing but one, two, or three substances, are more sure and reliable than those containing a larger variety. As will be explained under "*Prescriptions*," combinations of a large number of substances are in certain cases of advantage; but these combinations should not usually be made by patients, but by competent druggists.

5. Throughout the work the *prevention of disease* is kept continually prominent. The laws of health are treated of in great detail, because it is believed that by thoroughly knowing and observing them, much of the disease of the world could be prevented. The power of medicine at best is limited. Most of fevers run their course, and all that medicine can do is to relieve, to mollify, and sustain. The positive efficacy of medical science is most observed in the treatment of those *chronic* diseases where nature is incapable of effecting a cure, but where various combinations of remedial measures assist her to accomplish tasks to which, without such assistance, she would be unequal.

Most of chronic diseases, especially of the nervous variety, are best treated by the same methods by which they should be prevented—that is, by obedience to the laws of health. Therefore, in the treatment of all these nervous diseases, references are continually made to the subjects of diet, sleep, air, sunlight, exercise, and other important departments of hygiene.

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Anything like a complete list of all the sources from which the information in a work of such a character as this is derived, is manifestly impossible. I have only attempted to acknowledge those authorities that are nearest at hand, and to which I am chiefly indebted. I have also liberally consulted the medical and scientific periodicals, American and foreign, and have thereby received indispensable aid in my endeavor to represent the most recent views and experience of physicians of all countries.

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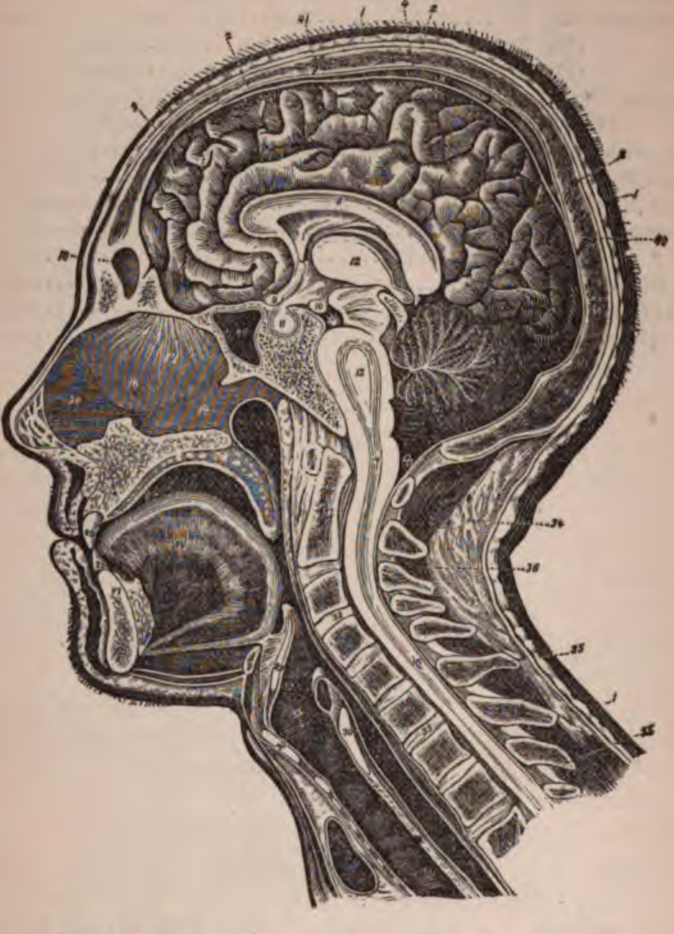
VERTICAL SECTION OF THE HUMAN BRAIN.

(*After Meinhold & Sons, Dresden.*)



3. Cranial Bones.
5. Cerebrum.
6. Cerebellum.
7. Arbor Vitæ.
8. Corpus-Callosum.
10. Mammillary Bodies.
11. Pituitary Glands.
12. Optic Thalamus.
13. Pons Varolii.
14. Medulla Oblongata.
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16. Frontal Sinus.
21. Mouth of Eustachian Tube.
24. Tongue.
26. Hard Palate.
29. Epiglottis.
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THE STRUCTURE AND FUNCTIONS OF THE HUMAN BODY.

ANATOMY AND PHYSIOLOGY.

BRIEF VIEW OF THE HUMAN BODY.

THAT we may understand for what purpose the human body is made to consist of such a variety of parts; why it possesses such a complication of nice and tender machinery; and why there was not a more simple, less delicate, and less expensive frame, it is necessary that we, in our imagination, make a man; in other words, let us suppose that the mind or immaterial part is to be placed in a corporeal fabric, in order to hold intercourse with other material beings by the intervention of the body; and then consider what will be wanted for its accommodation. In this inquiry we shall plainly see the necessity, advantage and wonderful adaptation of most of the parts which we actually find in the human body. And if we consider that in order to answer some of the requisites, human wit and invention would be very insufficient; we need not be surprised if we meet with some parts of the body whose use we cannot yet perceive, and with some operations and functions which we cannot explain. We can see that the whole bears the most striking tokens of excelling wisdom and ingenuity; but the imperfect senses and capacity of man cannot reach every part of a machine, which nothing less than the intelligence and power of the Supreme Being could contrive and execute.

First, then, the mind, the thinking, immaterial agent, must be provided with a place of immediate residence, which shall have all the requisites for the union of spirit and body; accordingly it is provided with the brain, and is governor and superintendent of the whole fabric.

In the next place, as it is to hold a correspondence with all material external beings, it must be supplied with organs fitted to receive the different kinds of impressions which they will make. In fact, we see that it is provided with the organs of sense, as we call them; the eye is adapted to light; the ear, to sound; the nose, to smell; the mouth, to taste; and the skin, to touch.

Further, it must be furnished with organs of communication between itself in the brain, and those organs of sense, to receive information of all the impressions that are made upon them; and it must also have organs between itself in the brain, and every other part of the body, fitted to convey its commands, and to influence the whole. For these purposes the nerves are actually given. They are soft white cords which rise from the brain, the immediate residence of the mind, and disperse themselves in branches through all parts of the body. They convey all the different kinds of sensations to the mind in the brain; and likewise carry out thence all its commands to the other parts of the body. They are intended to be occasional monitors against all such impressions as might endanger the well-being of the whole, or of any particular part; which vindicates the Creator of all things, in having actually subjected us to those many disagreeable and painful sensations to which we are exposed from a thousand accidents in life.

Moreover, the mind, in this corporeal system, must be endowed with the power of moving from place to place; for the sake of intercourse with a variety of objects; of escape, from such as are disagreeable, dangerous, or hurtful; and for the pursuit of such as are pleasant or useful. Accordingly it is furnished with limbs, muscles, and tendons, the instruments of motion, which are found in every part of the fabric where motion is necessary.

But to support; to give firmness and shape to the fabric; to keep the softer parts in their proper places; to give fixed points for, and the proper directions to, its motions, as well as to protect some of the more important and tender organs from external injuries, there must be some firm prop-work interwoven through the whole. And in fact, for such work the bones are given.

This prop-work is not made with one rigid fabric, for that would prevent motion. Therefore there are a *number* of bones.

These pieces must all be firmly bound together, to prevent their dislocation. And this end is perfectly answered by the ligaments.

The extremities of these bony pieces, where they move and rub upon one another, must have smooth and slippery surfaces for easy motion. This is most happily provided for, by the cartilages and mucus of the joints.

The spaces between these different organs must be filled up with some soft and ductile matter, which shall keep them in their places, unite them, and at the same time allow them to move a little upon one another. These purposes are answered by the cellular membrane or adipose (i. e. fatty) substance.

There must be an outward covering over the whole apparatus, both to give it compactness, and to defend it from a thousand injuries; which in fact, are the very purposes of the skin and other integuments.

Lastly, the mind being formed for society and intercourse with beings of its own kind, must be endued with powers of expressing and communicating its thoughts by some sensible marks or signs, which shall be both easy to itself, and admit of great variety. Accordingly it is provided with the organs and faculty of speech, by which it can throw out signs with amazing facility, and vary them without end.

Thus we have built up an animal body which would seem to be pretty complete; but as it is the nature of matter to be altered and worked upon by matter, so in a very little time such a living creature must be destroyed, if there is no provision for repairing the injuries which it must commit upon itself, and those to which it must be exposed from without. Therefore a treasure of blood is actually provided in the heart and vascular system, full of nutritious and healing particles, fluid enough to penetrate into the minutest parts of the animal, impelled by the heart, and conveyed by the arteries. It washes every part, builds up what was broken down, and sweeps away the old and useless materials. Hence the necessity or advantage of the heart and arterial system.

What more there is of the blood than enough to repair the present damages of the machine, must not be lost, but should be returned again to the heart; and for this purpose the venous system is provided. These requisites in the animal explain the circulation of the blood.

The old materials which have become useless, and are swept off by the current of blood, must be separated and thrown out of the system. Therefore glands, the organs of secretion, are given for straining whatever is redundant, vapid, or noxious, from the mass of blood; and when strained, they are thrown out by emunctories, called organs of excretion.

But as the machine is constantly in action, the reparation must be carried on without intermission, and the strainers must always be employed. Therefore there is actually a perpetual circulation of the blood, and the secretions are always going on.

All this provision, however, would not be sufficient; for that store of blood would soon be consumed, and the fabric would break down, if there was not a provision made for fresh supplies. These, we observe, are profusely scattered around us in the animal and vegetable kingdoms; and hands, the fittest instruments that could be contrived, are furnished for gathering them, and for preparing them in a variety of ways for the mouth.

But these supplies, which we call food, must be considerably changed; they must be converted into blood. Therefore are provided teeth for cutting and bruising the food, and a stomach for melting it down; in short, all the organs subservient to digestion. The finer parts of the aliments only can be useful in the constitution. These must be taken up and conveyed into the blood, and the dregs must be thrown off. With this view the intestinal canal is provided. It separates the nutritious part, which we call chyle, to be conveyed into the blood by the system of absorbent vessels; and the coarser parts pass downwards to be ejected.

We have now got our animal not only furnished with what is wanting for its immediate existence, but also with powers of protracting that existence to an indefinite length of time. But its duration, we may presume, must necessarily be limited; for as it is nourished, grows, and is raised up to its full strength and perfection so it must in time, in common with all material beings, begin to decay, and then hurry on to final ruin. Hence we see the necessity of a scheme for its renovation. Accordingly wise Providence, to perpetuate, as well as to preserve his work, besides giving a strong appetite for life and self-preservation, has made animals male and female, to continue the propagation of the species to the end of time.

Thus we see, that by the very imperfect survey which human reason is able to take of this subject, the animal man must necessarily be complex in his corporeal system, and in its operations.

He must have one great and general system, the vascular, branching through the whole for circulation; the nervous, with its appendages the organs of sense, for every kind of feeling; and a third, for the union and connection of all these parts.

Besides these primary and general systems, he requires others which may be more local or confined; one for strength, support, and protection, the bony structure; another for the requisite motions of the parts among themselves, as well as for moving from place to place, the muscular system; another to prepare nourishment for the daily recruit of the body, the digestive organs; and one for the continuance of the species.

In taking this general survey of what would appear originally tc be necessary for adapting an animal to the situations of life, we observe, with great satisfaction, that man is accordingly made of such systems, and for such purposes. He has them all; and he has nothing more, except the organs of respiration. Breathing it would seem at first difficult to account for;. we only know it from observation to be essential to life. Notwithstanding this, when we see all the other parts of the body, and their functions, so well accommodated for, and so wisely adapted to their several purposes, there can be no doubt that respiration is so likewise; accordingly the discoveries of Dr. Priestly, and of later inquirers, have thrown light upon this function also, as will be shown in its proper place.

Of all the different systems in the human body, the use and necessity are not more apparent than the wisdom and contrivance which have been exerted in putting them all into the most compact and convenient form; in disposing them so, that they shall receive helps from one another; and that all or many of the parts shall not only answer their principal end or purpose, but operate successfully and usefully in a variety of secondary ways.

If we consider the whole animal structure in this light, and compare it with any machine in which human art has exerted its utmost skill; (suppose the best contrived ship that ever was built;) we shall be convinced beyond the possibility of doubt, that intelligence and power have been exerted in its formation far surpassing anything of which men can boast.

One superiority in the animal economy is peculiarly striking. In machines of human contrivance there is no internal power, no principle in the machine itself, by which it can alter and accommodate itself to any injury which it may suffer, or remedy any mischief which admits of repair. But in the animal body this is most wonderfully provided for by the internal powers of the system; many of which are not more certain and obvious in their effects than they are above all human comprehension as to the manner and means of their operation. Thus a wound heals by a natural process; a broken bone is made firm again by a deposit of new bony matter; a dead part is separated and thrown off; noxious juices are driven out by some of the emunctories; a redundancy is removed by some spontaneous bleeding; a bleeding naturally stops of itself; a great loss of blood from any cause, is in some measure compensated by a contracting power in the vascular system, which accommodates the capacity of the vessels, to the quantity contained. The stomach gives information when the supplies have been exhausted; gives intimations, with great exactness, of the quantity and quality of what is wanted in the present state of the machine; and in proportion as it meets with neglect rises in its demands, and urges its petition in a louder tone, and with more forcible arguments.

For the protection of the animal amidst the fluctuations in the heat of external bodies, a power of generating warmth has been provided; and to prevent its undue accumulation in a heated atmosphere, or its excessive loss in a cold one, the quantity carried away is regulated with wonderful nicety to its wants; so that an equal temperature is preserved in all the range of climates, from the extreme point of habitable existence near the poles, to the intense heat of the equatorial regions.

A farther excellence in the natural machine, and if possible still more astonishing and more beyond all human comprehension than that of which we have been speaking, is the capability individuals possess of reproducing beings like themselves, which are again endued with similar powers for producing others, and so of multiplying the species without end.

These are powers which mock all human invention or imitation. They are characteristics of the Divine Architect.

OF THE BONES.

BONE AN ORGANIZED SUBSTANCE.

The bones, constituting, as was before observed, the basis and support of the body, are necessarily its most hard and solid parts, appearing to superficial observation to be merely inorganic compounds; resisting for ages the test of time; and remaining impressive memorials of the decay of past generations. Hence, some have been led to think they were without organization, and consequently not liable, like the soft parts of the body, to disease and death. But this erroneous opinion is refuted by minute dissection, which discovers the internal structure of bones, traces their numerous vessels, and shows them to be supplied with blood like the softer parts; and also, that, like these parts, they have their periods of growth and decay, and are liable equally with them to internal diseases, and to derangement from external injuries.

If, for instance, the vessels of adult bone be injected with red colored wax, and the earthy particles be dissolved by a mineral acid. the bone will be reduced to a membraneous state, but a jelly-like substance, full of vessels, will remain; and these vessels will now appear as numerous as in the fleshy parts, a proof that they were before concealed only by the earthy portion of the bone.

Before *birth* all the bones of the fœtus are of a cartilaginous character. This cartilage is not, as was erroneously supposed, hardened into bone; but is absorbed and carried away by one set of vessels, while another set is employed in depositing, in its room, matter for forming the new bones. This process is effected in the following manner.

The transparent vessels of the cartilage first begin to dilate to receive the red blood; at this time an artery can be observed penetrating towards the middle of the bone; this artery is soon accompanied by others, all forming a sort of net-work, and conveying red blood, and now ossification may be said to have commenced. Gradually the cartilage grows opaque and brittle, and will no longer bend. The bony centre spreads according to the dimensions of the bone; and may be known by its hard feel, when examined by a sharp instrument; similar points of ossification are now found and in a like manner, in other parts of the bone, till its whole body becomes opaque; and now the vessels, stretching from the centre towards the extremities, having penetrated the cartilages which separate the heads from the body of the bone, enter these heads, when ossification commences here also. From this mode of process it will be seen, that the heads and body are at first distinct bones, formed separately and connected only by cartilage, and they are not united till the age of eighteen or twenty years.

Thus the formation of bone is effected by the action of its blood vessels, which may be seen entering in one great trunk into the body of each bone, and spreading thence towards both extremities. It is by this action all the parts of the body are evolved; it forms the blood as is seen in the case of the chick, which has no other way of receiving this fluid but by forming it within its own body; and from the blood are all the solids constructed by the same action of the vessels. All animals have the power of assimilating their food, and with the assistance of air, of converting it into blood; and as by the action of their larger vessels they can thus elaborate fresh supplies of red blood, so the action of particular vessels is intended to prepare particular parts. Thus some add to the solids to assist growth, others for supplying the continual waste; while more are employed in effecting the different secretions within the body, one of which is the formation of bone. In this manner then is ossification accomplished; the arteries of the transparent cartilage of the fœtus, beginning at length to receive the red blood, commence their deposition of earthy matter. This at first appears in numerous specks, which spreading, afterwards meet, and at last constitute perfect bone. But, while these arteries are thus employed in depositing bone, there are other vessels, (called absorbents, from the nature of their function) busily engaged in removing the cartilage, modelling the new bone into its proper form, shaping out its cavities, and also hardening it into due consistence.

This organization of arteries to deposit bone, and of absorbents to convey away the cartilage, which was necessary to its formation and growth, is also essential to the life and health of the full formed bone. Indeed, the latter depends on the regular deposition and reabsorption of the parts; for by varying the degree of action in either of these operations, bone may be made to inflame and ulcerate like the softer parts, or to become too brittle by an over secretion of earth, or too soft from its excessive absorption. It is this earth which constitutes the hardness, and, indeed, all the serviceable properties of bone. It lies dead in the inorganic interstices of the membrane, and is united with animal mucilage to give it consistence and strength.

That the bones, in common with the rest of our frames, undergo a constant renovation of parts, is proved by the following experiment. If madder be given to animals, then withheld for some time, and afterward given again, in twenty-four hours after it had been first given, all their bones will become tinged; and in two or three days the color becomes very deep. In a few days after the madder has been discontinued, the red color disappears; but on its being again given to the animals, their bones become a second time tinged. Further, the absorption of bones, is also proved by the disappearance of a carious or dead bone, even before the skin is opened; and by the destruction of a bone, merely from the pressure of a tumor against it; in which cases the bone must have been taken up by the absorbing vessels and conveyed away; and lastly, this absorption is placed beyond all controversy, by the fatal disease called "mollities ossium;" (softening of the bones;) which in a short time dissolves and carries off, by an excessive action of the absorbents, the bony system; discharging the earthy matter by the kidneys, and gradually rendering the bones soft, till they bend under the weight of the body and may be cut with a knife.

But this vascular nature of bones not only sustains their health by constantly removing and carrying off their wasted and unsound particles, and furnishing them with new ones; but also, by extending to them the circulation in common with the other parts of the body, it enables those useful organs to repair their injuries by uniting such as may be broken. And here we cannot help admiring the beneficence as well as wisdom of the Creator, who thus kindly interweaves, not only with the soft parts of the human machine, but also, with its most hard and solid substances, the means of supplying their waste and of repairing their injuries.

If, for instance, a bone be fractured, its broken ends will unite in the following manner; first, the arteries discharge a thin mucus, which afterwards thickens into a transparent jelly and becomes vascular, by the elongation of vessels from the neighboring parts; these vessels soon begin to secrete the osseous matter, till the whole jelly becomes one bony mass, and thus the fractured ends are completely united. That this desirable result may be the more certain, the formation of new bony matter is not confined to any one part or to particular vessels in the bone; but is generously bestowed upon its entire system; for not only will the vessels of the periosteum, (the membrane covering and lining the bones) produce fresh osseous matter; but so also will those of the bone itself; as will likewise the vessels of the marrow, which is contained within the cavity of the bones. Thus, if by puncturing the bone of an animal we destroy the marrow, the old bone decays, and a new one will be formed from the periosteum; and, should the creature soon afterwards die, and the bone be inspected, it will be found to be a secretion from the inner surface of the periosteum, bearing all the characteristics of true bone, and containing within it the old bone, dead and black. But if this experiment be reversed, and the periosteum only is destroyed, preserving the nutritious vessels of the bone; in this case the new bony matter is formed by the medullary vessels, and the old bone surrounding it, will become black and dead. Lastly, when the knee-pan, where there are no medullary vessels, is fractured, the broken parts are united by the intervention of a callus, secreted from the vessels of the bone itself.

Again, if a bone is injured by blows or other accidents, which derange its economy and damage its structure, the circulation soon repairs the mischief in the following manner. First, inflammation takes place, as in the soft parts of the body; next, a swelling and spongy looseness with a fulness of blood ensue; suppuration and ulceration soon follow; and finally, the diseased bone becomes completely dead, and is discharged from the system.

Bones, besides arteries, veins, and absorbing vessels, have also, like the soft parts, their nerves. These may be discovered entering like small threads into the body of the bone, in company with its nutritious vessels; and yet, notwithstanding we can trace the course of some of these nerves, a bone appears to possess no sensibility. Thus, rasping the periosteum, and even scraping it from the bone, produces no pain. In amputation bones are cut without exciting particular feeling. Even the application of the actual cautery formerly in use, was known to produce only a kind of heat along the course of the bone, not unpleasant to the patient. But it must not be supposed from these facts that bones are wholly insensible, they are in reality otherwise; but their sensibility being fitted to their functions, is so regulated as not to appear under the generality of those circumstances, which produce it in the soft parts of the body. Hence the shocks from running, leaping, and other violent exercises, cause no sensation in the bones; and which, if otherwise ordered, must have subjected them to almost continued pain, from the nuerous blows and other accidents they encounter. The same wise provision is extended to the cartilages, ligaments, and other parts composing the joints, and for the same reason; namely, to prevent the occurrence of pain on every uneasy motion or concussion which these parts are liable to endure.

But though bones exhibit this inaptitude to sensibility, in their healthy state, and on ordinary occasions; this is far from being the case when they are diseased. Injuries will produce inflammation in the bones as well as in the soft parts, and now their hidden sensibility becomes roused, and even surpasses that of the latter, though excited from a like condition. This is also the case with the cartilages, ligaments, and all the other parts in which sensibility appears dull during health. Thus the wound of a joint is certainly less painful at first, but inflammation coming on, the sensibility of the injured parts rises to an excruciating degree; and no pains are felt to equal those arising from bones and joints.

Thus it will be seen that ossification is a process of a truly animal nature; and that bone is a regularly organized substance, whose form subsists from the first. Bone partakes by its vessels of the general changes with all the other parts of the body; the absorbents removing the old wasted parts, while the arteries are constantly depositing new ones; and thus it lives, grows, and is enabled to repair its injuries. Ossification is at first rapid; advances slowly after birth; but is not completed in the human body till the twentieth year; it is forwarded by health and strength of constitution; and is retarded by weakness and disease. In scrofula it is imperfect; and so children become rickety, the bones softening and swelling at their heads, and bending under the weight of the body

The structure of bones, as may be seen by breaking those old and decayed ones which are found in church-yards, consists of plates made up of fibres, and those plates connected by other fibres; by which formation a great number of interstices or cells are to be met with in the heads of the long bones, while their sides have a more dense, and firm construction.

THE PERIOSTEUM.

The bones are covered with a membrane, called on that account periosteum. It adheres closely to their surface, by small points, which dive into the outward substance of the bones, so that it may bear the pulling of the great tendons, which are fixed rather into the periosteum than into the bone. It is also connected with the bones by innumerable vessels, which are transmitted to them through the medium of this membrane. The periosteum is not itself vascular, and appears to be merely condensed cellular membrane. If, however, it be hurt by injuries, the outer layers of the bone die, because the vessels which nourished and sustained their health, are now destroyed or prevented from continuing their function, by the injury of the membrane through which they passed into the bone. But the internal layers will now set about repairing the mischief. These, being fully nourished by the internal arteries, inflame, swell, become porous and spongy, and form granulations. These granulations, push off the mortified plate, and form themselves into new bone, which supplies its place.

The uses of the periosteum appear to be, to nourish, by the vessels which pass through it, the external layers of the bone; to afford a convenient origin and insertion to several muscles and tendons which are fixed into this membrane; and to prevent, by the looseness of the external surface, friction, in the sliding of the muscles over the bones.

THE MARROW.

The marrow is an oily secretion from the blood, and is lodged in membraneous vesicles or cells, which fill up the larger and smaller cavities within the bones. These minute bags are formed from the membrane which lines the cells within the bones.

The precise use of the marrow is not yet ascertained; but its consistence varies in different periods of life. In infancy it is thin and tinged with blood. It thickens as we advance in life.

The destruction of the marrow, as we before observed, produces the death of the bone in which it is contained; and from the same cause, that injuries of the periosteum will be the means of destroying the external plates, namely the destruction of the vessels; for as the periosteum is the medium by which the external vessels are conveyed to the bone, so the internal ones are conducted to its substance by the membrane containing the marrow, and lining the inside of the bone; whence the marrow being destroyed, the channels for conveying nourishment are cut off, and the bone dies.

LIGAMENTS.

The bones are connected to each other by ligaments, which are strong, white, flexible substances, and but little elastic. They are of two kinds, the round or cord-like ligament, which grows from the head of one bone, and is inserted into that of the other, tying the two bones together; and the capsular ligament, which encloses the whole joint as in a purse or bag, and has numerous arteries opening upon its internal surface, for the purpose of keeping it moist, and of diminishing friction.

CARTILAGES.

But the more effectually to preclude friction and concussion, all the bones forming moveable joints, have their ends covered with plates of cartilage, which being of a solid, smooth, elastic nature, renders all the motions of the joints easy and free from shocks in running, jumping, &c.; and to increase this effect, there are also moveable cartilages interposed between the ends of the bones, in some of the joints.

THE SYNOVIA.

Besides the fluid which the capsular ligament throws out, there are small fringe-like bodies placed within the joints, for securing a constant and copious supply of moisture. They secrete a singularly glairy and slippery liquor called synovia, for lubricating the different surfaces of the joint, and preventing friction in the various motions of the body. After the synovia has performed its office, it is reabsorbed by the absorbent vessels, which arise by open extremities from all the cavities of the body.

OF THE SKELETON OF THE HUMAN BODY.

The bones of an animal connected together, after the soft parts have been removed, is called a skeleton; and is said to be a natural one when they are kept together, as in the living state, by their own ligaments; but artificial if they are joined with wire, or any other substance, foreign to the animal.

The human skeleton we shall divide, for the purposes of description, into the head, the trunk, the superior and inferior extremities.

OF THE HEAD.

By the head is meant all that part which is placed above the first bone of the neck. It therefore comprehends the bones of the skull and those of the face.

THE SKULL.

The skull or brain-case consists of eight bones, which form a vaulted cavity for lodging and defending the brain; this great cavity is proportioned to its contents, which is the cause of such variations in its size in different persons; while its roundish figure is chiefly owing to the equal pressure of the contained parts, as they grow and increase, before the skull is entirely ossified; and to the management of the head during this period is to be attributed the difference of shape observable in different nations. Hence from the use of the turban, the head of a Turk assumes a round figure, greatly different from that oblong shape, which characterizes those nations, with whom the turban is not in use.

A more striking instance of the degree in which the human head may be modelled by national customs, is found among the Caribbee Indians, who by flattening the forehead in early infancy, produce a hideous deformity of aspect.

Some of the Faquirs of India are well known for the cone-like shape to which they mould their heads.

The bones of the skull are composed of two tables, and an intermediate lattice-work, nearly of the same structure and use, as that of the other bones. The outer table or plate is the thicker and stronger of the two, being more immediately concerned in warding off injuries of the head.

The eight bones of the skull are the *frontal-bone*, which forms the whole fore-part of the skull; the two *parietal-bones* forming its upper and middle part; the two *temporal-bones* composing the lower part of the sides; the *occipital-bone* making the whole hinder part, and some of the base; the *ethmoid-bone*, placed in the fore-part of the base of the skull; and the *sphenoid-bone* in its middle.

SUTURES.

These bones are joined to each other by what anatomists call sutures, which are indented or dovetailed seams; their uses are not well understood. Some have supposed that they were intended to limit the extent of fractures in the skull; others, that they enable the dura mater, or membrane lining the inside of the head, to suspend itself more firmly, by insinuating its fibres through those sutures, and communicating with the membrane on the outside. But these opinions, with many others, are contested and admit of doubt; and, perhaps, it is more reasonable to believe that sutures are merely a consequence of the mode in which the ossification of the skull takes place, rather than a formation, designed for certain uses. We see the bones of the skull ossify from the centre towards their circumference, their fibres spreading and extending on every side, till at last those different bones meet, and shooting in between each other, form the suture or serrated line of union. Nature, in the formation of all bones, hastens their ossification, by beginning the process in many points, and she observes this law in healing a broken bone, as well as in forming the skull. Had the process of ossification in the head been confined to one point, it must necessarily have been slow and imperfect, and the brain would have continued a long time exposed to injuries from without. Instead of this, we find a distinct system of ossification going forward at the same time in each of the bones composing the skull, all spreading from their centres, and approaching each other to make one whole, perfect, bony case for lodging the brain. But it should be observed here, that this ossification is not complete for a long time after birth ; the bones not having yet sufficiently grown for their edges to meet. The imperfectly ossified state of the skull appears to be better suited to the growing and increasing condition of the brain during this period, than if its ossification had been quite complete ; as in this case the flexibility of the skull must be less, and its capacity not so easily enlarged by the increasing bulk of the brain. One beneficial consequence results from the imperfect ossification of the skull at birth, which is too important to omit, and which, perhaps, was the principal aim nature had in view, in adopting this peculiar structure ; namely, the opportunity it affords of contracting the size of the head in child-birth. It is almost constantly found that the bones overlap one another very considerably, and lessen the head in both its diameters to a surprising degree.

BONES OF THE FACE.

The face is the irregular pile of bones composing the fore and under part of the head. It constitutes the bony portion of some of the organs of sense, affording sockets or orbits to the eyes, an arch to the nose, and a support to the palate ; it also forms the basis of the human physiognomy, and enters into the composition of the mouth. Anatomists, in their description, commonly divide the face into the upper and lower jaws.

It consists of six bones on each side ; of a thirteenth placed in the middle, and having no fellow ; and of sixteen teeth. The thirteen bones are, viz. the two nasal ; two ungular ; two cheek-bones ; two maxillary bones ; two palate bones ; two spongy bones of the nose ; and the single bone, called the vomer, and which divides the nose.

The two *nasal bones* form the root and arch of the nose.

The two *ungular bones*, so called from their resembling the nail of one's finger, constitute the inner angle of each orbit. Each of these bones has a deep perpendicular canal for lodging a part of the lachrymal sac and duct, by which the tears are conveyed into the nose; and it is this bone which is operated upon in the disease called fistula lachrymalis, which is an obstruction of the duct, by which the tears, instead of flowing off by the nose, trickle over the face. The operation is performed by piercing the bone with an instrument, which opens an artificial communication with the nose, and the tears are conducted through that channel.

The two *cheek bones* are the prominent square bones, which form the upper part of the cheeks. They constitute a distinguishing feature in the human countenance, as may be seen by comparing the high cheek-bones of the Tartars, and other northern nations, with the more regularly formed countenances of the people of southern climates.

The two *maxillary bones* are the largest, and constitute the far greater part of the upper jaw. They form the most part of the nose, a great portion of the roof of the mouth, and also a considerable share of each orbit; at their lower edge they afford a base and sockets for containing the sixteen upper teeth. Each of these bones has a large hollow in its body, which is lined with a continuation of the membrane of the nose. It is called the maxillary sinus, has a small opening into the nostrils, and is supposed to be intended for raising and making the voice more perfect, by creating a reverberation of the sounds. Sometimes collections of matter form in this sinus, attended with great pain, inflammation, and swelling of the cheek, and even distortion of the face; in this case the matter is discharged by pulling out the second or third of the grinding teeth, and introducing a sharp stillet by the socket of the drawn tooth, then perforating the bony partition, which is here generally very thin, into the sinus.

The *palate-bones* are placed at the back part of the palate or roof of the mouth, and are continued up the back part of the nostrils, to the orbits; forming part of the palate, nostrils and orbits.

The spongy bones are four in number, two in each nostril; they are so named from their porous texture, being rolled into scrolls, and their thin laminæ of bone are pierced by many holes, which renders them very light. They are covered with the membrane of the nose, which lines universally all the cavities of this organ. The points of the lower of these bones form those projections which may be felt by the finger, and from the improper practice of picking the nose, very often serious consequences arise; for in many instances polypi of the spongy bones which are fleshy excrescences and which can be traced to injuries of this kind, grow so as to extend down the throat, and cause suffocation and death.

The *vomer*, so called from its supposed resemblance to a ploughshare, is a thin flat bone; constituting the thirteenth and last bone of the upper face. It forms the lower and back parts of the division of the nose. Its upper edge is united to the base of the sphenoid-bone, and to the nasal-plate of the ethmoid. Its anterior edge has a long furrow for receiving the middle cartilage of the nose; and its lower edge is joined to the maxillary and palate bones. This bone divides the nostrils from each other, and like the spongy bones enlarges the organ of smelling by affording greater space for the expansion of the membrane of the nose.

THE LOWER JAW.

The lower jaw consists of only one moveable bone and sixteen teeth. It is nearly of the form of a crescent, or half moon, terminating the outline of the lower part of the face, forming the under part of the mouth, and serving as a frame for holding and working the lower teeth. The fore-part of this bone is termed the chin, from this its sides extend back to what are called the angles of the lower-jaw. Here its base ends, and the bone bends upwards at right angles, to be articulated with the head. From these rising branches shoot out two processes or bony projections on each side; the first is called the coronoid, or horn-like process, and is intended for the convenient insertion of the temporal muscle, the lower end of this muscle being fixed into the whole of that process; and being placed at a distance before the articulation of the jaw, gives the muscle great power in moving it. The other is the articulating process; it lies behind the former, is of an oblong shape, and set across the branch of the jaw. These articulating extremities are received into two large cavities, hollowed out in each temporal bone near the ear, and are connected to these bones, by means of capsular ligaments, which extend from one bone to the other, and enclose the joint as in a bag. Not only the surfaces of the bones composing these joints are covered with cartilage, to prevent friction, but, to render their large and numerous motions more secure and easy, a moveable plate of cartilage is interposed, which plays between the articulating surfaces, and thus facilitates their motions. It is thin in its centre and thickens towards its circumference, by which contrivance the hollow of the joint is deepened, and the hazard of dislocation is lessened. Such moveable cartilages are generally placed in joints where frequent and rapid motion is required.

The sockets of the teeth in the lower-jaw are similar to those of the upper, but their number and size in both are various, because of the different numbers, as well of the teeth themselves, as of their roots. As the body grows, the jaw-bone slowly increases in length, and teeth are added in proportion, till the jaws acquire their full size, when the sockets are completely filled, the lips are extended, and the mouth is said to be formed. But, in the decline of life, when the teeth fall out, the sockets are reabsorbed and carried away, as if they had never been; then the chin projects, the cheeks become hollow, and the lips fall in, the sure marks of old age.

Fractures of the lower-jaw are more or less transverse, and are known by the falling down of one part of the bone. They happen from blows or falls, but never by pulling teeth, the sockets of the teeth which alone are broken in their extraction, bearing but a small proportion to the rest of the jaw; and even in children this cannot happen, for in them the teeth have no roots, nor any hold or dangerous power over the jaw.

OF THE TEETH.

The teeth of an adult are generally in number sixteen above, and as many below, though some people have more; others, fewer. The part appearing without the socket, is called the base or body, and those parts within, the roots or fangs. These roots become generally smaller towards the end farthest from the base; and are nearly conical, by which the surface of their sides lessens the pressure made by their bases, and prevents the soft parts, at the small points of the sockets, being hurt by such pressure. Each tooth is composed of its enamel, (an extremely hard substance covering the outer surface of the tooth) and an internal bony substance. The enamel has no cavity or place for marrow, and is so extremely hard, that saws or files can with difficulty make an impression upon it. It is thickest upon the base, and becomes thinner towards the extremities of the roots. Its fibres are all perpendicular to the internal substance, and are straight on the base, but at the sides are arched with a convex part towards the roots, which enables the teeth to resist the compression of any hard body between the jaws, with less danger of breaking these fibres, than if they had been situated transversely. The spongy sockets in which the teeth are placed, likewise serve better to prevent such an injury, than a more solid base would have done. The internal bony part of the teeth is of the nature of other bones; like them it is supplied with blood-vessels and nerves, and like them it is subject to the disorders of other vascular parts. Hence, when the enamel breaks or falls off, and the internal part becomes exposed to the air, it soon corrupts, and a carious tooth is produced, perfectly hollow within, and having only a small hole externally. The vessels and nerves enter by a small opening placed a little to the side of each root, and thence descend to be lodged in canals formed in the middle of the teeth; here they are employed in replacing the waste constantly made by the friction they undergo in mastication.

The teeth are commonly divided into three classes, viz: the incisores, canini, and grinders or molares. The incisores, so called from their use in cutting the food, are the four teeth in the fore-part of each jaw. The canini derive their name from their resemblance to a dog's tusks. They are the longest of all the teeth, are placed one on each side of the incisores, so that there are two canini in each jaw, which seem to be intended principally, not for dividing or grinding like the other teeth, but for laying hold of substances. The grinders, of which there are ten in each jaw, are so named, because from their shape and size they are fitted for grinding the food. Each of the incisores and canini is furnished only with one fang; but in the molares of the under jaw, we constantly find two fangs, and in those of the upper jaw, three fangs.

This structure and arrangement of all the teeth displays a wonderful degree of art. To understand it properly, it will be necessary to consider the under jaw as a kind of lever, with its fixed points at its articulations with the skull; that this lever is worked by its muscles; and that the aliment constitutes the object of resistance to its elevation. Thus it will be seen, that the grinders, from being placed nearest the centre of motion, and from their uneven surfaces, are fitted for the purpose of grinding food; while the canini and incisores, being placed farther from this point, from the sharpness of their edges, which overlap each other as the blades of scissors do, are particularly adapted to cut and tear the food.

There are examples of children who have come into the world with two, three, and even four teeth; but these examples are very rare; and it is seldom before the seventh, eighth, or ninth month after birth, that the incisores, which are the first formed, begin to pass through the gum. The symptoms of dentition, however, in consequence of irritation from the teeth, frequently take place in the fourth or fifth month. About the twentieth or twenty-fourth month the canini and two grinders make their appearance. The symptoms are more or less alarming, in proportion to the resistance which the gum affords to the teeth, and according to the number of teeth, which may chance to seek a passage at the same time. Were they all to appear at once, children would fall victims to the pain and excessive irritation; but nature has so very wisely disposed them, that they usually appear one after the other, with some distance of time between each. The first incisor that appears is generally in the *lower jaw*, and is followed by one in the upper jaw. Sometimes the canini, but more commonly one of the grinders, begin to pass through the gum first. These twenty teeth, viz. eight incisores, four canini, and eight grinders, are called temporary or milk teeth, because they are all shed between the age of seven and fourteen, and are succeeded by what are called the permanent or adult teeth; and which are of a firmer texture, and have longer fangs. These adult teeth being placed in a distinct set of sockets, and the upper sockets being gradually removed as the under ones increase in size, at length the temporary, or upper teeth, having no longer any support, fall out. To these twenty teeth, which succeed the temporary ones, twelve others are afterwards added, viz. three grinders in each side, in both jaws; and in order to make room for this addition, we find that the jaws gradually lengthen in proportion to the growth of the teeth; so that with twenty teeth they seem to be as completely filled, as they are afterwards with thirty-two. This is the reason why the face is rounder and flatter in children than in adults. In extreme age the teeth drop out, their sockets are removed also, and the face again shortens.

With regard to the formation of the teeth, we may observe, that in a fœtus of four months the alveolar process appears only as a shallow longitudinal groove, divided by minute ridges into a number of intermediate depressions; in each of which we find a small pulpy substance, surrounded by a vascular membrane. This pulp gradually ossifies, and its lower part is lengthened out to constitute the fang. When the bony part of the tooth is formed, its surface begins to be incrusted with the enamel. The rudiments of some of the adult teeth begin to be formed at a very early period, for the pulp of one of the incisores may generally be perceived in a fœtus of eight months, and the ossification commences soon after birth.

THE BONE OF THE TONGUE.

There is a small bone, nearly of the figure of the lower-jaw bone, and which though not classed with those of the head or trunk, yet as being situated near to the head, we shall describe before we come to those of the trunk. This bone corresponds in place with the chin, below which, about an inch, it may be felt, the uppermost of the hard points in the fore part of the throat; where being placed horizontally, it lies immediately between the root of the tongue and the upper part of the wind-pipe, and carries upon it a valvular cartilage, for shutting the passage and preventing any thing getting down this tube; while its legs extend along the sides of the throat, keeping the openings of the wind-pipe and gullet extended, as we would keep a bag extended by two fingers. This bone is the centre of the motions of the tongue, for it is the origin of those muscles which compose chiefly the bulk of the tongue; of the motions of the wind-pipe, for it forms at once the top of the wind-pipe and the root of the tongue, and joins them both together; of the motions of the gullet, for its legs surround the upper part of the gullet, and join it to the wind-pipe; and it also forms the centre for all the motions of the throat in general; for muscles come down from the chin to this bone, to move the whole throat upwards; others ascend from the breast, to move it downwards; while different muscles come from the sides to move the throat backwards. This bone is called the os hyoides.

OF THE TRUNK OF THE HUMAN BODY.

The Trunk of the Human Body Comprises the Spine, the Pelvis, and the Thorax, or Chest.

THE SPINE.

The spine or back-bone is that long chain of bones which extends from the skull to the end of the loins. It consists of twenty-four distinct bones named vertebræ, from the Latin word *vertere* to turn; because they perform at certain points the chief turnings and bendings of the body. They also form a tube or canal along the whole length of the spine, for lodging and defending from harm the spinal marrow; and they support the whole weight of the trunk, head, and arms, without suffering under the longest fatigue, or the greatest load which the limbs can bear. Hardly any thing can be more beautiful or surprising than this mechanism of the spine, where nature has established the most opposite and inconsistent functions in one set of bones; for their motions are so free as to turn continually, yet so strong as to support the whole weight of the body; and so flexible as to bend quickly in all directions, yet so steady within as to contain and defend a material and very delicate part of the nervous system.

The vertebræ are divided into those of the neck, back, and loins, and the number of pieces corresponds with the length of these divisions. The vertebræ of the neck are seven in number; their form is simple, they being almost like rings, their processes scarcely project; they are very loose and free; and their motions are the widest and easiest of all the spine. The twelve immediately below these are the vertebræ of the back; they are larger and stronger than the former, and their processes project obliquely downwards, so as to be laid over each other; hence one bone is fastened to the other, which, together with their connection with the ribs, renders this the steadiest part of the spine, and allows it only a very limited motion. The vertebræ of the loins are the next and the last; they are five in number; they bear the whole weight of the body, and perform the chief motions of the trunk, and with this view, nature has made them the largest and strongest of the entire vertebræ, and given them a wide and free arrangement of their processes.

The form of each vertebra is particularly calculated for producing the different uses of the spine, and displays at once the astonishing designs and execution of the Supreme Architect. The spine is intended as a support to the trunk, head, and arms; for this purpose each vertebra is composed of a main part, called its body, which is a thick, spongy, and therefore light bony substance, convex before, concave at the back part, and almost horizontal upon its upper and under sides, when it is joined to similar bodies of the other vertebræ. All these bodies are connected together, like the sections of a large cane, and constitute a bony pillar for sustaining the upper parts of the body. But, besides support, these parts require motion; hence, this pillar is furnished with all the means of producing it. First, then we see it divided into many pieces; having a perfectly elastic substance interposed between every two bodies, and which by easily yielding to whatever side we bend, and afterwards, by a powerful rebounding returning to its place in a moment, takes off pressure from the delicate nervous column, and thus preserves it from injury in the violent and sudden motions of the body. During the day this elastic substance is continually yielding to the pressure, so that we are an inch taller in the morning than at night; we are shorter in old age than youth; and the aged spine is bent forwards, owing to the yielding of this part.

Next, we observe projections standing out from the back-part of the spine for different purposes. The first are the articulating processes, of which the body of each vertebra furnishes four. They grow out obliquely, two from the upper and two more from the under part of each body, and incline towards those of the other vertebræ, till they meet to be articulated; when they serve the double purpose of fastening together, and securing, in conjunction with the intervertebral substances, the different pieces of the spine; and also, by affording so many moveable joints, of assisting in its motions.

From between these superior and inferior articulating processes, the body of each vertebra sends out two arms, which meeting behind form an arch or canal for the spinal marrow; and from the middle of that arch, and opposite to the body, another process, called the spinous projects. These processes have their direction backwards, and from the sharpness of their points, which form the ridge of the back, give the name of spine to the whole column. They are intended to serve as so many handles and levers for moving the spine; their size enabling the muscles to take a firm hold, while their length gives those muscles a powerful force in extending and raising the spine. But, beside these, there are other processes, which, from their direction, are called transverse processes, because they stand out at right angles, or transversely, from the body of the bone. They grow out from the sides of the arms or branches which form the arch for the spinal marrow, and are two in number to each vertebra. They also serve as levers, and long and powerful ones, in moving and turning the spine.

Thus we see that each vertebra consists of a body and seven processes; but it must be understood, that this is not the case with all the vertebræ. As we observed before, the vertebræ of the neck are very indistinctly marked, and the first two materially differ from the general character, for the purpose of adopting a most beautiful piece of mechanism.

The first vertebra of the neck is named atlas, from the globe of the head being immediately placed upon it. Its processes are scarcely distinguishable; it has no body; and is simply a ring, through which the spinal marrow passes from the great hole of the skull into the rest of the tube, formed for its reception. The atlas is articulated at two points, one on each side, with the occipital bone of the skull, and these joints being strictly hinge-like, enable the head to move backwards and forwards, but allow it no motion to either side. This motion, called the rotatory, is performed by means of a tooth-like process, which rises from the upper part of the body of the second vertebra of the neck, and which forms the chief characteristic of that bone. This process is about an inch in height, resembling in some degree the little finger; stands perpendicularly upwards, passing through the ring of the atlas, and serves as an axis, on which this bone, and with it the head may perform all the rotatory motions. It is confined by ligaments, one of which connects its front with the edge of the occipital hole, and the other, extending from one side of the atlas to the other, embraces the tooth-like process, and prevents its injuring the spinal marrow. When this ligament is burst by violence (as has happened) the tooth-like process breaks loose, and pressing upon the spinal marrow, the person dies.

All the vertebræ conjoined, make a large canal of a triangular or roundish form, for lodging the spinal marrow, and which, as it descends, gives off its nerves to the neck, arms, and legs; and the whole course of this canal is rendered safe and smooth by lining membranes, which serve the double purpose of connecting the different bones together, and of affording a soft and easy sheath to the marrow.

Thus we see that a vertebra consists of different parts, all admirably suited to produce their various purposes. Its body helps to form the pillar for sustaining the upper parts of the frame. The intervertebral cartilages, which are placed between the different bodies, being of a highly elastic nature, admit motion and prevent concussion; while the numerous processes, which grow out from the bone behind, act as so many handles and levers, by which the muscles move and work the spine; and also serve to form the tube or canal for containing the spinal marrow.

OF THE PELVIS.

To give a steady bearing to the trunk, and to connect it with the lower extremities, by a sure and firm joining, the pelvis is interposed. It is a circle of large and firm bones, standing as an arch betwixt the lower extremities and the trunk. Its arch is wide and strong, so as to give a firm bearing to the body. Its individual bones are large, so as to give a deep and sure socket for the implantation of the thigh-bone. Its motions are free and large, bearing the trunk above, and rolling upon the thigh-bones below; and it is so truly the centre of all the great motions of the body, that when we believe the motion to be in the higher parts of the spine, it is either the last vertebra of the loins bending upon the top of the pelvis, or the pelvis itself rolling upon the heads of the thigh-bones.

The pelvis, is constructed, in the adult, of four large bones, viz of the os sacrum behind, the ossa innominata on either side and before, and the os coccygis below.

The os sacrum or hinder bone is the base, on which the spine, and consequently the whole body, rests, its upper surface being articulated with the under one of the last vertebra of the loins. It is of an irregular triangular shape, broad above for supporting the trunk; narrow below; convex behind; and concave before; it guards the nerves proceeding from the end of the spinal marrow, and also forms the back part of the pelvis. Within this bone, there is a triangular cavity, which is a continuation of the canal of the spine. Here the spinal marrow ends, and branching into a great many thread-like nerves, has the form of a horse-tail, and is therefore named cauda equina. These nerves afterwards go out by five great holes, which are on the fore-part of the bone, to be distributed to different parts.

The *os coccygis* is a continuation of, or rather an appendage to, the sacrum; it consists of four bones in the middle age, each bone becoming smaller, as it descends, till the last ends almost in a point, and by bending inwards serves to contract the lower opening of the pelvis, so as to support effectually the viscera within. These two bones, the sacrum and coccygis, are described by most anatomists as parts of the spine, and certainly not without reason. They are a continuation of that chain of bones, and perform some of their functions; supporting, like them, the weight of the body, lodging the spinal marrow, and transmitting some of its nerves; but as they are precluded motion, and are closely locked in between the other bones of the pelvis, so as to constitute a principal share of this basin, at its hinder part, we think it adviseable to class them as bones of the pelvis in the description.

The sides and fore-part of the pelvis, as we before observed, are composed of two bones, which correspond in size and figure with each other, but, being of a most irregular shape, are called the ossa innominata, or nameless bones. In children each of these bones consists of three separate pieces, which afterwards, when greater strength is acquired, and ossification is become more perfect, are so firmly united as to form but one bone; still these bones continue to be described as though each consisted of three pieces.

The os ilium, or haunch-bone, is the highest, constituting each upper side of the pelvis, and has its posterior edge firmly and immoveably articulated to that of the os sacrum. It forms the flank, and is the largest division of the os innominatum.

The os ischium, or hip-bone, lies perpendicularly under the former, and is the lowest point of the pelvis, upon which we sit.

The os pubis, or share-bone, is the last and smallest piece of the three, forming the fore-part of the pelvis, and completing its brim.

Each os innominatum has a cup-like hollow for the head of the thigh-bone to move in. It is formed at that part where the three original pieces, which we have described, meet, to form one bone, and is called the acetabulum, from its resemblance to a measure which the ancients used for vinegar.

The pelvis is intended for many great purposes in the human frame; first, it is the base for supporting the superior parts of the body; next, it is so constructed as to receive into its sockets, and to roll upon the heads of the thigh bones, by which means it connects the lower extremities with the upper parts of the frame, without precluding motion; and, lastly, by forming a kind of basin at the lower end of the trunk of the body, it helps to sustain its viscera; while its outside surfaces, its ridges, and projecting points, serve as so many convenient places for the origin and insertion of numerous muscles, which, having one of their extremities fixed into the pelvis, as into a kind of circular basis, perform, by means of it, with the advantage of a lever, some of the motions of the trunk, and many of those of the lower limbs. The male pelvis differs from the female, in being much thicker, and more rough, and its cavity being less.

OF THE THORAX.

The thorax or chest is that large cavity reaching from the neck to the lower end of the breast-bone before, but extending further downwards at the back, and including all that space which lies between the opposite ribs. It is intended to afford a secure and commodious residence for the heart, lungs, &c., and is formed, behind, by the twelve dorsal vertebræ of the spine; at the sides, by the ribs; and by the breast-bone, before.

THE RIBS.

The ribs form the sides of the chest, covering and defending the heart and lungs. They also assist in breathing, being joined to the spine by regular hinges which allow of short motions, and to the breast-bone by cartilages, which yield to the motion of the ribs, and return again by means of their elastic nature, when the muscles cease to act. They are generally twelve in number on each side, though frequently eleven or thirteen have been found. Those whose cartilages are separately inserted into the breast-bone are called the true ribs, and are seven in number, while the five lower ones, whose cartilages do not reach that bone, but run into each other, and are joined to it by a common cartilage, are designated by the name of false ribs. The lower edge of each rib is furrowed along its internal side for the safe passage of the vessels and nerves between the ribs; and, to the ridge, at each side of this canal, are fixed the double rows of muscles, which lie between the ribs.

THE STERNUM.

The sternum, or breast-bone, is commonly composed of three bones, joined together by cartilages. It extends from the upper to the lower part of the breast anteriorly, and has the ends of the ribs and collar bones articulated with it, by which the cavity of the chest is completed, as far at least as the bones are concerned.

This bone, the ribs, and indeed all the chest. stand so much exposed, that did we not guard them with the hands, fractures must be very frequent; but, when they are broken and beaten in, they hurt the heart or lungs, and not unfrequently the most dreadful consequences ensue. Often, by a wheel passing over the body, the breast-bone is broken; its pieces press inward upon the heart, which is sometimes burst; but more commonly the patient dies a slow and painful death; for the inflammation, which begins in the place of the wound is extended to the lungs, and propagated still onwards to the heart; which, being once inflamed, brings on anxiety, oppression, faintings and palpitations; then anxious breathing, quick and interrupted pulse, still more frequent faintings, and lastly death. But the ribs, covering more properly the lungs, do not always produce death by their fractures, for the wound by the point of a rib is no deeper than just to puncture the lungs; yet through this small wound on their surface, the lungs breathe out their air into the cavity of the chest, and at last it escapes under the cellular substance of the skin, when the man becomes exceedingly inflated, his breathing more and more interrupted, and, if not assisted, he must die.

Having now described the bones which form the trunk of the body, we next come to those of the limbs, and first to the bones composing the upper limbs.

THE SUPERIOR EXTREMITIES.

Each Superior Extremity consists of the Shoulder, Arm, Fore-arm, and Hand.

THE SHOULDER.

The shoulder includes two bones, the clavicle and scapula. The clavicle or collar-bone is placed at the root of the neck, and at the upper part of the breast. It lies almost horizontally, and extends across from the tip of the shoulder to the upper part of the breastbone. Its figure is long, round, and curved like an italic *S*, and serves the shoulder as a kind of arch, supporting and preventing it from falling in and forwards upon the breast, by which the motions of the arms would be confined, and the chest made narrow, which must be the case, were these bones wanting. The collar-bones also make the hands strong antagonists to each other, which otherwise they could not be.

The scapula, or shoulder-blade, is the other bone of the shoulder. It is a broad, flat, triangular bone placed upon the outside of the ribs, and serving as a base to the whole superior limb. Its under side is somewhat concave, to match the convexity of ribs, yet it is not in immediate contact with them, but is separated from them by several layers of muscular flesh; so that this bone may glide upon the trunk, and increase the motion of the limb which is suspended from it. For this reason the scapula is not jointed with any bone of the trunk, or connected to it by ligament, as such connections must impede the freedom of its motions; but it is securely held to the trunk by those very muscles which perform its movements. The arm-bone is jointed with the scapula, at one of its angles; this angle terminates in a flat surface, not more than an inch in diameter, for receiving the head of that bone; and, as it is very shallow, dislocations of the shoulder are more frequent than of any other joint. A high ridge called the spine, rises from the back or external surface of the scapula, and traversing its whole length, runs forward to terminate in that high point or promontory which forms the tip of the shoulder and overhangs and defends the joint. This projecting point of the scapula is called the acromion process; it almost makes a part of the shoulder joint, preventing dislocation upwards; and is the part which is jointed with the collar-bone. There is also another process which stands out from this angle of the scapula, and is intended to secure the joint, and prevent dislocation likewise. It is a thick, short, but crooked process, and is adapted to defend the joint at its inner side. But the principal strength of this union of the joints arises from the muscles, which, passing from the shoulder-blade over the joint, are inserted into the arm-bone close to its head. These muscles in their passage, closely embrace the head of the arm-bone, adhere to the capsular ligament which encloses the joint; and, by spreading themselves over it, thicken and increase its strength. They also by their contraction hold the arm-bone in its place.

The shoulder-blade, as we before observed, is not fixed, but moves upon the trunk; it therefore serves as a moveable intermediate base to the whole arm which hangs from it. For this purpose it is firmly held to the trunk by numerous and strong muscles, which can move it in various directions, and, by a quick succession of these movements, can carry its whole body in a circle, by which greater scope is given to the motions of the arm. This bone also serves to cover and defend the back-part of the chest.

THE ARM.

The arm is commonly divided, in the description, into two parts, which are joined with each other at the elbow. The upper part, or os humeri, retains the name of arm, properly so called, and the lower part is usually termed the fore-arm.

The arm, then, is that division extending from the shoulder to the elbow. It has only one bone, which is long, round, and nearly straight, and which is united at the shoulder by its round head being received into the hollow of the shoulder-blade, and connected thereto by ligaments, which enclose the whole joint as in a bag. But that this joint may have the freest motion, the hollow for receiving the arm-bone is extremely shallow, so that its round head might easily turn in all directions; and the connecting ligaments, for the same reason, are longer than in other joints. Then, as in all other moveable unions of the joints, not only is the head of the arm-bone tipped with cartilage, but the surface of the cavity into which it is received is also lined with the same substance, for the purpose of preventing concussion and friction; and the more effectually to preclude the latter, an oily fluid is constantly moistening the whole internal surfaces of the joint, and is supplied from the inner side of the capsular ligament, and also from soft, spongy substances, which are placed within the joint. The lower end of the arm-bone is connected with those of the fore-arm, at the elbow, carrying them with it in all its motions, and serving as a base on which they perform their peculiar movements.

THE FORE-ARM.

The fore-arm is composed of two bones, viz. the ulna and the radius. The ulna is the longer of the two bones, and is extended from the wrist on the side of the little finger to the point of the elbow, where it assumes a hook-like form; the concave side of which being fitted to the pulley-like surface of the lower end of the arm-bone, produces the motions of flexion and extension, so that the fore-arm may be bent to a very acute angle, or extended to almost a straight line with the arm.

The radius is the second bone of the fore-arm. It is but partially articulated (i. e. jointed, or joined) with the end of the arm-bone, and has its position reversed with that of the ulna; for the ulna, belonging principally to the elbow, has its greater end upwards; the radius, principally belonging to the wrist, has its greater end downwards; and while the ulna only bends the arm, the radius carries the wrist with a rotatory motion, and for this purpose it is so articulated with the ulna at the ends, (the only points where these bones meet) that it turns upon it in half circles. The two bones are connected together along their whole length by a strong ligament, which extends from one to the other, filling up the vacant space between them, and rendering their position the more secure. The radius is hollowed at its lower end for receiving the bones of the wrist in articulation, but the ulna does not reach quite so far as to come in contact with those bones.

THE HAND.

The hand comprehends all from the joint of the wrist to the ends of the fingers. Its back-part is convex for greater firmness and strength; and it is concave before for containing more conveniently such bodies as we take hold of.

Anatomists generally divide the hand into the carpus, or wrist-bones; the metacarpus, or bones that stand upon the wrist, and serve as a basis to the fingers; and the fingers, consisting, each one, of its three joints.

The carpus, or wrist, is composed of eight small bones, disposed in two rows. Those of the upper row form an oblong head, to be articulated with the cavity of the radius of the fore-arm, so as to allow motion on all sides; and, by a quick succession of these motions, the hand may be moved in a circle. The lower row is articulated with the bones of the metacarpus, to which they serve as a solid foundation or centre. These small bones are firmly tied to each other by strong ligaments. There are two in particular which deserve notice; one is situated on the external, and the other on the internal, side of the wrist, and both not only help to strengthen the parts on which they lie; but also confine, and serve as smooth lubricated sheaths to the tendons which pass under them.

The metacarpus consists of four long round bones for sustaining the fingers. They are founded upon the wrist bones; but, departing from them as from a centre, in somewhat of a radiated form, they allow the fingers a freer play. These bones are connected to each other by plain surfaces, and are tied at their lower ends by ligaments, which prevent their being drawn asunder. Consequently they have not a large motion.

THE THUMBS AND FINGERS.

The thumb and four fingers are each composed of three bones. The thumb is placed obliquely with respect to the fingers, and its bones are thicker and stronger than those of the former; which is necessary, as the thumb is intended to counteract all the fingers. All the bones of the fingers are placed in three rows, called phalanges. The first phalanx is articulated with the bones of the metacarpus, and consists of the largest bones; the second stands out from the first; and the last grows out from the second and completes the fingers. These different bones composing the fingers are all regularly jointed with each other, and in such manner as to allow not only a hingelike but also a rotatory motion.

THE INFERIOR EXTREMITIES.

Each of the Lower Extremities comprises the Thigh, the Leg, and the Foot, and has a grea analogy in the structure and distribution of its parts with the Upper Extremities.

THE THIGH.

The thigh, like the arm, has only one bone, which is the longest in the whole body, and the largest and strongest of all the round bones. Its upper end inclines inwards, and swells into a large, smooth, round head, to be articulated with the cavity, which is afforded by the side bones of the pelvis. Just below this head the bone becomes small, whence this part is called its neck. The articulation of the thigh-bone with the trunk is secured by strong ligaments; the first is almost peculiar to this point, and is called, from its shape, the round ligament. It grows out of the articulating cavity, and is inserted directly into the head of the bone. The other is the capsular ligament, which, arising from the rim of the articulating cavity of the pelvis, passes over the whole joint, embraces the head of the thigh-bone as in a purse, and is inserted into this bone at its neck. The body of the thigh-bone continues thick and strong down to its lower end, where it spreads with two great protuberances, called condyles, to be articulated with the bones of the leg. This bone not only serves as a fixed point for performing several motions of the trunk, which it sustains like a pillar, but it also affords a base for the leg to carry on its own motions, and is principally concerned in walking, running, &c.

THE LEG.

The leg is composed of three bones; two long ones, called tibia and fibula; and a small one placed at the knee.

The tibia is the long triangular bone at the inside of the leg; it runs nearly in a straight line from the thigh-bone to the ankle, supporting the whole weight of the body, and has its upper end expanded into a large surface for receiving the lower end of the thigh-bone, and forming the knee-joint. This articulation admits flexion and extension, and is secured by very strong ligaments; to compensate for the weakness of its bony structure, arising from the flatness of the articulating surfaces; the joint not being protected as in other cases by a ball and socket, by a large head imbedded in a deep cavity, by over-hanging bones, or by hook-like projections, all which were contrivances ill adapted to its motions. In this instance the strength and complexity of the ligaments are the resources which have been elected. At the sides of the joint the capsular ligament is peculiarly strong. The contrivance of a ligament within the cavity of the joint, and directly connecting the two bones, is improved upon by a striking adaptation to the necessities of the case. Instead of one, there are two such ligaments which cross each other, and hence are named "crucial (or cross) ligaments;" and by a varied tension of each in different positions of the joint, they check its motions and secure its safety.

This, however, is not all that is admirable in the mechanism of this curious joint. On the top of the tibia are placed two moveable cartilages of a crescent-like form. Their outward edges are thick, while their inward borders are extremely thin, and they thus form a hollow, in which the protuberances of the thigh-bone play with security, and with a facility that is much increased by their loose connections.

Hence, although this joint be the most oppressed by great loads, and the most exercised in continual motions, yet it is less frequently displaced than any other. The lower end of the tibia is articulated with the foot and forms the inner ankle.

The fibula is a long slender bone placed at the outside of the tibia. Its head is connected to that bone by ligaments, but does not reach high enough to enter into the composition of the knee-joint; it lies along-side the tibia, somewhat like a splint, increasing the strength of the leg, and like the double bone of the fore-arm, also completing its form. This bone descends to the foot, where it forms the external ankle, and is connected to the tibia, along its whole length, by a broad thin ligament, similar to that which is found between the bones of the fore-arm.

The knee pan is the third and last bone of the leg. It is a small thick bone, of an oval, or rather triangular form. The base of this triangle is turned upwards to receive the tendons of the great muscles which extend the leg, the pointed part of this triangle is turned downwards, and is tied by a very strong ligament to the upper part of the tibia, just under the knee. The patella, or knee-pan, is intended as a lever; for by removing the direction of the muscles of the leg farther from the centre of motion, it enables them to act more powerfully in extending the limb. To facilitate its motions, its internal surface is smooth, covered with cartilage, and fitted to the pully of the thigh-bone, upon which it moves.

THE FOOT.

The foot, like the hand, is divided into three parts, viz. the *tarsus* or instep, the *metatarsus*, and the toes.

The tarsus or instep is composed of seven bones, firmly bound together by strong ligaments; and forming a sure and elastic arch for supporting the body. The uppermost of these bones, called the *astragalus*, is articulated at its superior surface with the bones of the leg in such manner, as to afford the motions of flexion and extension in the ankle joint; while the sides of this bone are overlapped by the two processes which descend from the tibia and the fibula, to form the internal and external ankles so completely, as to secure the joint from dislocations. The astragalus is joined below to the os calcis, and serves as the immediate base for supporting the bones of the leg. The *os calcis* or heel-bone is the largest of the seven bones. Behind, it projects, forming a large knob, called the heel, for receiving the insertion of the tendon of Achilles.* It is situated under the astragalus, with which it is so firmly connected as scarcely to admit motion, but which renders this principal part of our base, which rests on the ground, secure and firm. Its lower surface is pressed flat at the back-part, by the weight of our bodies, this bone being the basis of the whole frame.

The tarsus or instep is convex above, but leaves a concavity below for lodging safely the several muscles, tendons, vessels, and nerves, that lie on the sole of the foot; and being composed of several bones, all having slight movements with each other, and firmly tied together by ligaments, so as to prevent dislocation, is well adapted to afford sufficient elasticity for precluding shocks in walking, running, or the other motions of the body; and also for security against fractures, to which it would have been liable had the tarsus been composed of only one bone.

The *metatarsus* is composed of five bones, which correspond in their general character with the metacarpal bones of the hand; but are longer, thicker, and stronger than the latter. The bases of these bones rest upon the instep; while their extremities support the toes, in like manner as the metacarpal bones sustain the fingers. When we stand, the fore-ends of these bones and the heel-bone are our only supporters.

THE TOES.

Each of the toes, like the fingers, consists of three bones, except the great toe, which has only two bones. Those of the other four are distinguished into phalanges. In walking the toes bring the centre of gravity perpendicular to the advanced foot.

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* Grecian fable tells us that Achilles, when an infant, was dipped by his mother in the river Styx to render him invulnerable. The heel was not dipped because she held him by this part; there he was wounded. From this story is derived the name tendo-Achillis.

THE SESAMOID BONES.

There are small bones found in different parts of the human body, and which, from their resemblance to the seed of the sesamum, obtain their name. They are nothing more than portions of the ligaments of joints, or of the tendons of muscles become bony by pressure ; and are uncertain both in their number and situation.

RETROSPECT OF THE SKELETON.

When the bones of an animal are connected together, after the soft parts have been removed, the whole is called a skeleton. Upon its dimensions depend the height, and, in a great measure, the breadth, and strength of the human body. Had this frame been constructed of fewer bones, our actions must necessarily have been rendered constrained, and less convenient. It is therefore wisely divided into numerous pieces, for enlarging the sphere of motion; while all its divisions are peculiarly and admirably fitted to the various uses for which they have been designed.

The head, as we have seen, forms a spheroidal case for lodging and defending the brain within its cavity. In the head, and contiguous to the emporium of sense, we also find organs of sight, hearing, smelling, tasting, and speech; the more rapidly to transmit information to the brain, and also to obey its commands.

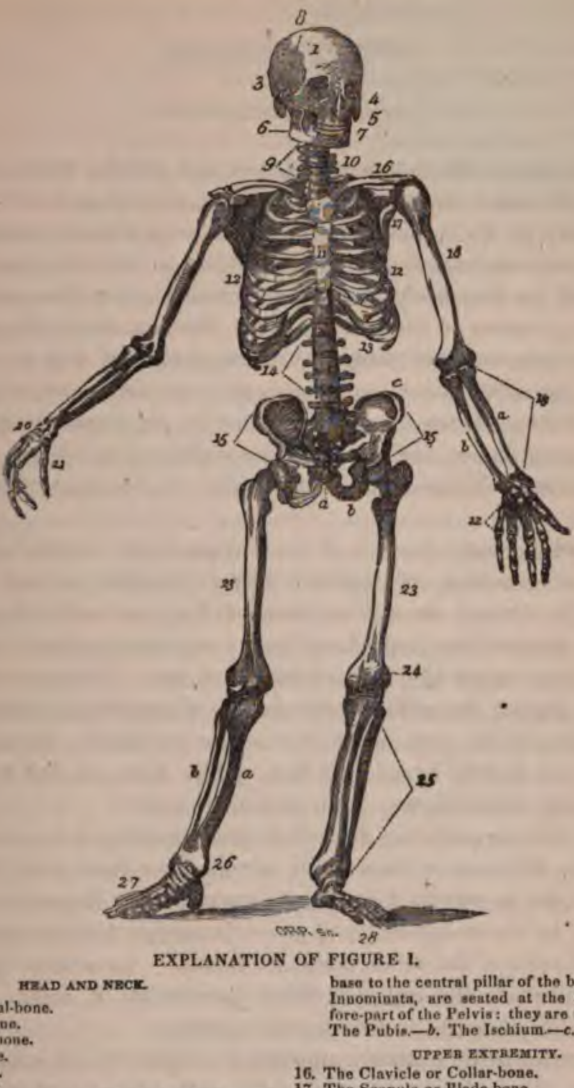
From the head, we see descending a large chain of bones, called the spine, or back-bone, and reaching down to the extremity of the pelvis. This bony pillar not only supports the head, and superior parts of the body, but also affords a canal along its descent for safely lodging that continuation of the brain called the spinal marrow; and being divided into several small bones, connected together by elastic substances, and having a great number of processes projecting like so many small handles, for the muscles to take hold of and work by, it allows the neck, back, and loins, a sufficient motion.

From the upper part of the spine, the ribs extend out on each side, and meeting at the breast-bone before, they form the cavity of the chest for lodging and defending the heart, and the organs of respiration.

The lower part of the spine, supporting all the parts of the body which are superior to it, is itself received in a wedge-like form, and supported by the bones of the pelvis. These bones are so constructed as to serve at the extremity of the trunk not only as a kind of basin, for sustaining some of its viscera, as the intestines, &c. but also, as a medium of connection between the body and the lower extremities, affording a firm and safe support to the former, and producing the necessary motion at the hip-joints, by rolling upon the round heads of the thigh-bones.

In viewing the superior extremities, we observe that the base of each is placed in a situation, the best calculated for the limb to perform all its motions, and at the same time to defend from injuries the head and chest; while the muscles which are necessary to work the limb, serve as a defence and covering to the vital parts within the ribs. The division of each extremity into several bones, and their peculiar connection, are intended to produce large motion; that, at the shoulder, is sufficiently free for describing a circle; at the elbow the arm may be bent to an acute angle, whilst the wrist is capable of much motion; as are the thumb and fingers; the whole limb producing a collective motion sufficiently great for all the purposes of necessity and convenience.

The inferior extremities we also see divided into several bones, and for the purposes of motion; but, serving as two moving columns for the support and carriage of the rest of the body, they are necessarily stronger, and their joints firmer and more confined. Hence the thigh-bone has less motion than that of the arm; the joint of the knee is stronger than that of the elbow; and the motion of the ankle and toes is slower, but more firm than that of the wrist and fingers.



EXPLANATION OF FIGURE I.

HEAD AND NECK.

1 The Frontal-bone.
2 Parietal-bone.
3 Temporal-bone.
4 Cheek-bone.
5. Upper Jaw.
6. Lower Jaw.
7. Teeth, imbedded in their bony cavities formed by the alveolar processes.
8. One of the Sutures separating the Bones of the Head; the Coronal.
9. Vertebræ of the Neck.
10. The Transverse Projections from the Vertebræ for the attachment of Muscles.

THE TRUNK.

11. The Sternum or Breast-bone.
12. The Ribs, 7 true and 5 false Ribs.
13. Their Cartilages, connecting them with the Sternum, and which replace the Ribs, by their elasticity, when they are elevated by inspiration.
14. The Vertebræ of the Loins with their transverse Processes.
15. The Bones of the Pelvis; the Sacrum is a broad base to the central pillar of the body; the Ossa Innominata, are seated at the sides and the fore-part of the Pelvis: they are divided into *a*. The Pubis.—*b*. The Ischium.—*c*. The Ilium.

UPPER EXTREMITY.

16. The Clavicle or Collar-bone.
17. The Scapula or Blade-bone.
18. The Humerus or Arm-bone.
19. The Bones of the Fore-arm.
    a. The Radius, on which the Arm turns.—*b*. The Ulna.
20. The 8 Bones of the Carpus or Wrist.
21. The Bones of the Thumb.
22. The Metacarpus, forming the Palm, the back of the Hand, and the Finger-bones.

LOWER EXTREMITY.

23. The Thigh-bone.
24. The Patella or Knee-pan.
25. The Bones of the Leg.
    a. The Tibia.—*b*. The Fibula.
26. The Inner Ankle formed by a projection of the Tibia.
27. The Metatarsus.
28. The Toes.

OF THE MUSCLES.

GENERAL DESCRIPTION.

Those organs which move the bones, and put the whole frame into motion, are called muscles, and constitute all that part of the human body known by the name of flesh. Each large muscle consists of two distinct portions, namely, its belly, which is the only part that is active, and its thin cordy fibrous and shining extremities, or tendons. The only purposes of the last are to fix the muscles to the moveable parts in a concentrated form; in consequence of which, a greater power is permitted to act, as laborers are assisted by ropes in moving weighty bodies; hence they are principally employed in implanting muscles upon bones, and are not discoverable in the heart, stomach, or intestines. Muscles are universally the organs of motions in animals.

The whole fleshy portion of the human body consists of a great number of muscles, or distinct fleshy bundles, whose surfaces, although in contact, are still separate, sliding over each other, in their alternate contractions and elongations; and having both ends fixed into the parts which they are intended to move. They are of different sizes and shapes, according to the degree of force required from them, and the form of the part on which they are situated. Hence those on the body are mostly broad and flat, while those of the extremities are of a long, round figure, with tendinous ends.

Each muscle performs its action by contracting both ends towards the centre, when one of these ends, serving as a fixed point, the other, with the bone to which it is affixed, is necessarily drawn towards it; and thus, by the co-operation of several muscles, the movement of the limb, and even of the whole body, is effected. As soon as the motion is accomplished, the muscles, which performed it, relax, and allow their ends to elongate to their former position.

The structure of a muscle appears to consist of a number of long soft fleshy fibres, lying parallel with each other; and these fibres being enveloped in a thin cellular membrane, are fastened by it into little bundles, which are again tied by some of the same membrane into larger bundles, until the whole muscle is produced; but, though this is the apparent structure of the muscle, its ultimate division is unknown; that which appears to the eye to be an elementary fibre, being discovered, by the help of glasses, to consist of a bundle of fibres.

In this very general description of muscles the form and appearance of those larger ones which cover our bones have been kept more particularly in view. But it would convey a very imperfect idea of their extent and importance to confine our observations to them. Muscular fibres, in fact, enter into the structure of almost every organ where motion is necessary, and are adapted in their form and size to that of the parts to which they are attached. The heart and blood-vessels; the stomach and intestines; the bladder, &c; are composed, in a great measure, of very minute muscular fibres, stretching longitudinally, transversely, or obliquely, and sometimes in all directions; often so small are they that we can only discover their structure by our glasses, and not unfrequently they escape our detection altogether.

We shall now take a rapid view of the different muscles which move the human body; first, however, observing, that excepting a few, the whole of the muscles on the one side of the frame have corresponding muscles on the other. If an exact section of the whole human body were made, from the top of the head to the lower end of the trunk, the divided sides would be found similar in structure and parts to each other, the contents of the breast and abdomen only excepted, and which from their nature and situation do not admit of equal division.

We also observe, that the end of the muscle, which forms its more fixed point, is called its origin; while the other end, which is fastened to the bone to be moved, is termed its insertion; and likewise, that the shape and turn of the part, particularly of the limbs, depend principally upon the size and proportions of the muscles which are situated thereon. Thus we see many of them taper into long slender tendons, where a decrease of size is necessary and beautiful, as at the small part of the fore arm and leg; while others swell out in symmetrical proportion, and give the appearance of fulness and strength to other parts of the frame.

MUSCLES OF THE HEAD.

The fore-head is wrinkled and drawn upwards, as are also the eye-brows, by a broad thin muscle, which rises at the back-part of the skull, and covering the head runs down the forehead, to be inserted into the skin of the eye-brows.

The eye-brows are drawn towards each other, and the skin of the fore-head pulled down and made to wrinkle, as in frowning, by a pair of small muscles, which rise from the root of the nose, and are inserted into the inside of the eye-brows.

The ear is moved by eleven small muscles. The first three are called common, because they move the whole ear. The next five are termed proper, and only move the parts to which they are connected;

while the other three are internal, to move the small bones situated within the ear.

The eye-lids are closed by a muscle, which, rising from the inner angle of the orbit or cavity in which the eye is embedded, covers the under eye-lid, then surrounds the outer angle, and passing over the upper eye-lid, descends to be inserted, by a short, round tendon, near to its origin.

The eye is opened by a muscle, which (rising from the inner and upper part of the socket) is inserted into the upper eye-lid, to draw it upwards.

The eye-balls are carried through all their motions by six small slender muscles to each. They arise from the bottom of the socket, and are inserted into the outer coat of each eye-ball at different points. Four of these move the eye upwards or downwards, to the right and to the left; while the two remaining muscles give oblique directions to the eye, at the same time protruding it; and all, acting in quick succession, enable the ball of the eye to describe a complete circle.

The nose is affected by several small muscles of the face, but only one muscle on each side is proper to it. This muscle straightens the nostrils, and wrinkles the skin of the nose.

The mouth and lips are moved by nine pair of muscles, which arising from the contiguous bones of the face, are inserted into the lips and angles of the mouth; and from the termination of these muscles a tenth is formed, which surrounds the mouth like a sphincter,* and closes it, by drawing the lips together. It is from the actions of these muscles on the mouth, particularly at its corners, that the emotions of the mind are expressed, and the predominance of particular feelings in individuals is indelibly stamped; save in those whom nature has gifted with an unimpressible dulness of character, or in whom the more delicate lines are filled up by too great fatness. Perhaps it may be worth while to notice the cause of that distortion of features which is produced by palsy. The muscles on one side then cease to act, while those of the other, contracting with their usual force, the mouth is drawn on one side.

The lower-jaw has four pair of muscles for pulling it upwards, as in chewing, viz. two pair which are seen upon the outside of the face, and two pair that are concealed by the angles of the jaw. The first pair arise from the sides of the skull, above the temples, whence they are called temporal muscles; and then descending under the bony bridges of the cheek-bone, are inserted into the lower-jaw near its ends. The second pair arise, at each side, from the under edge of the bony bridge, and descending along the cheek, are inserted into the angle of the lower-jaw. These four muscles act powerfully in pulling the jaw upwards, and when we bite, may be felt swelling out in the flat part of the temple, and upon the back-part of the cheek. The other two pairs of muscles arise from the base of the skull, and are inserted into the lower-jaw internally for enabling this bone to move from side to side, the more effectually to grind the food. The lower-jaw is pulled downwards by muscles, which extend between it and the bone of the tongue, and which also serve to raise the throat upwards.

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* A muscle which contracts or shuts an orifice round which it is placed.—Ed.

MUSCLES OF THE NECK.

The neck is covered with numerous and complicated muscles. Those on the fore-part or throat extend some between the head and upper part of the trunk; others between the lower-jaw and the tongue-bone; more between this bone and the cartilages of the throat; while numerous other small muscles are situated between these cartilages and the trunk; and also about the root of the tongue and the back-part of the mouth.

Their uses are, viz. to bend the head forwards; to open the mouth by pulling the lower-jaw downwards; and to move the parts concerned in deglutition and speaking.

The muscles on the back-part of the neck are rather portions of the great muscles, which cover the back, than distinct bundles of fibres; but, having some of their extremities fixed to the back-part of the skull, and also to the hinder portion of the spine of the neck, are intended to move those parts, drawing them backwards and sideways

MUSCLES OF THE TRUNK.

These are principally the muscles which cover the breast; those which constitute the fore-part and sides of the abdomen; and the great muscles that are spread over the back.

The muscles of the back are numerous and large. They arise from the whole length of the spine or back-bone, having their originating fibres firmly fixed to the numerous processes or handles of that bone; from the upper and posterior edge of the pelvis; and also some portions from the back part of the skull; and from these different organs, they spread over and cover the back of the trunk, and run to be inserted, some into the base of the arm, others into the spine at a distance from their origin, and the remainder into the ribs and back-part of the skull. They consequently not only cover and protect the whole back-part of the body, but also serve to pull the head backwards, move the whole arm, assist respiration by acting on the ribs, and to give us an erect posture by extending the spine. These are the muscles which suffer in the barbarous practice of whipping; and instances have occurred, where from the too great weight of the whip, or the excessive number of lashes inflicted, the structure of these muscles has been so cruelly torn and destroyed, as to put it out of the power of nature to restore it; mortification has followed, and the unfortunate sufferer expired a victim to inhumanity or ignorance.

The cavity of the abdomen is completed at its fore-part and sides by a few broad and thin muscles, which extend from one bone to the other, having their ends firmly fixed to the edges of these bones; and passing over each other, constitute walls for covering in and containing the bowels. These muscles also assist respiration by helping to expel the air from the lungs; and they contribute to the movement of the body, by bending it forward as in bowing, and by raising the pelvis.

The breast is covered by a few broad and strong muscles, which arise from the whole length of the breast-bone, and form the fore-part of the ribs, and running from each other over the chest, are inserted into the shoulder for moving the limb forward.

The ribs are raised, and the cavity of the chest enlarged, during inspiration, by eleven double rows of small muscles on each side. They grow out from the lower edge of one rib, and are inserted into the upper rim of the next.

MUSCLES WITHIN THE BODY.

The principal one is called the diaphragm; it is a broad thin muscle, occupying partly a horizontal position, when the body is erect; but inclining downwards towards the back, and dividing the trunk of the body into the two great cavities, the thorax and the abdomen. It arises from the lower end of the breast-bone; from the cartilages of the seventh, and of all the inferior ribs on both sides; and from the second, third and fourth vertebræ, belonging to the loins, called *lumbar* vertebræ; and from these origins its fibres run, like radii, from the circumference to the centre of a circle, to be inserted into a broad flat tendon, which is situated in the middle of this muscle. The diaphragm is the principal agent in respiration, as shall be more fully described under that head.

The other muscles within the body arise from the sides of the lower end of the back-bone, and from the inner surface of the pelvis, and passing down to be inserted into the thigh-bone, a little below its head, they help to turn the toes outwards, and to bend the thigh; or when the limb is fixed, they assist in bending the body.

From Professor Dalton's excellent treatise on Physiology and Hygiene* I quote the following remarks on the muscles:

"If the muscles be examined by the microscope they are seen to be composed of a great number of very small *fibres*, too minute to be seen by the naked eye, placed side by side, and all running in nearly the same direction. These fibres are ruddy in color, and very elegantly marked by transverse lines or stripes, which run around them in a circular direction. The fibres themselves are united into small bundles, of from 100 to 200 each, which are placed side by side with other similar bundles, but separated from them by a thin layer of loose intervening tissue, called *Cellular Tissue.* A number of these bundles are also united into larger bundles with cellular tissue between them, and these again into still larger. Thus the entire muscle is made up of many bundles of parallel fibres, which can be separated from each other by careful dissection, and reduced to finer and finer divisions, until they become too small for the naked eye. It is this which gives to the muscular flesh its fibrous appearance on close examination.

"Now the muscles, as we have described them, are endowed with the power of *Contraction.* By this it is meant that the muscular fibres, when they are excited by the influence of the will, can shorten themselves so as to draw together any two points to which their ends are attached. Both ends of a muscle are never attached to one and the same bone, but between their two attachments there is always an articulation or joint, which allows of motion between one bone and the other.

"In contracting, therefore, the muscle draws the two bones to which it is attached nearer to each other.

"Whenever a muscle contracts, it swells from side to side at the same time that its fibres are shortened; and very accurate experiments have shown that it increases in thickness in exactly the same proportion that it diminishes in length. It does not become, therefore, either larger or smaller during contraction, and only changes its shape, but not its size."

"If we grasp with the fingers the muscles on the front part of the arm above the elbow, we can perceive their contraction whenever we bend the elbow forcibly upward. At this time two changes in the muscle are distinctly felt. First, it swells, as we have already said, and becomes prominent under the skin; and, secondly, it becomes at the same moment harder and more resisting to the touch."

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* I cannot too highly commend this work of Professor Dalton. It should be in every school and family.

The muscles act like levers. The action of the muscles of the arm in raising the fore-arm has been likened to a lever of the ***third*** kind. The muscle works at a great disadvantage, because it is inserted *so near to the fulcrum.* But this seeming disadvantage is really an advantage, for it allows of greater freedom of motion. A careful study of the mechanism of the arm shows us that it is a most wonderful contrivance, and is admirably fitted for the purposes for which it is used by man.

MUSCLES OF THE SUPERIOR EXTREMITIES.

These, anatomists divide into the muscles that are situated on the shoulder-blade, on the arm, on the fore-arm, and on the hand.

The muscles situated on the shoulder-blade are called muscles of the arm, because, though they arise from the former bone, which serves to them as a base, yet they are inserted into the bone of the arm, to effect its movements. The same observation holds with respect to the other divisions of these muscles.

The arm, then, is moved by seven muscles, which arise from the shoulder-blade, and passing over the joint are inserted into the arm-bone at its upper and middle parts. These, together with the muscles coming from the back and breast, which are already described, complete the motions of this part of the limb.

The fore-arm is moved in flexion and extension by four muscles, which arise from the upper part of the arm-bone; run down its whole length, and constitute its fulness and figure; they then pass over the elbow joint to be inserted into the upper ends of the two bones of the fore-arm.

The hand is moved at the wrist by six muscles; three of these arise from the upper part of the fore-arm, and descending along its whole length, are continued over the wrist, and inserted into the hand close to this joint; they bend the hand, and are consequently called its flexors. The three extensors, so called because they extend the hand and bring it backwards, arise from the lower end of the arm-bone, and passing down the fore-arm also, run to be inserted into the back of the hand just beyond the wrist. All these muscles, before they reach to the wrist, become slender tendons, which is the cause of the tapering of the fore-arm from about its middle to the hand.

Besides flexion and extension, the hand has a circular kind of motion, called pronation and supination. The former takes place when we turn the palm down, as upon a table; the latter when we turn the palm upwards; and both motions are produced by four short muscles which extend obliquely across from one bone of the fore-arm to the other, and roll the radius upon the ulna, carrying the wrist round in circles.

The fingers are principally moved by two flexors and one extensor. The former muscles arise from the upper part of the fore-arm near the bend, and running down towards the wrist, send off four round tendons each; which, passing over the palm of the hand, are inserted the one set of tendons into the upper part of the second bone, and the other into the last bone of each of the four fingers. The latter set of tendons pass through slits in the former, which help to bind them down, when the fingers are bent. The extensor muscle arises above the elbow, passes down the fore-arm, and also divides into four round tendons, which can be plainly felt on the back of the hand, and are inserted into all the bones of the four fingers for extending them.

The other movements of the fingers, and those of the thumb, are performed by muscles chiefly situated upon the hand; and which, together with those we have described, complete the motions of these parts.

MUSCLES OF THE INFERIOR EXTREMITIES.

The great muscles which move the thigh all arise from the pelvis, or the lower part of the trunk; covering, and also giving plumpness and shape to the external surface of these parts, they descend over the hip-joint, to be inserted into the thigh-bone below its articulating head. By the action of these powerful muscles the thigh is carried through all its motions.

The leg is moved by eleven muscles, which arise partly from the pelvis and partly from the upper end of the thigh-bone. They descend along this bone, giving fulness and shape to the thigh, and passing over the knee-joint, are inserted into the bones of the leg; the extensors into the upper edge of the knee-pan, for extending the leg; and the flexors into the posterior sides of the long bones of the leg, a little below their heads. The tendons of these muscles form the inner and outer hamstrings. They bend the leg.

The foot is moved by three extensors, and by four flexors. The extensors arise, the two first by double heads from the lower end of the thigh-bone, near the bend of the knee. These heads soon after unite into the great fleshy bellies, which, swelling out, form the calf of the leg; but decreasing where the leg begins to grow small, they each give off a broad thin tendon, which also uniting, form the tendon of Achilles, to be inserted into the extremity of the heel. These powerful muscles extend the foot by bringing it backwards, and are principally engaged in running, walking, leaping, &c. The third extensor of the foot arises also from the lower end of the thigh bone, and descending by a long, slender tendon, is inserted into the heel, to assist the former; but this muscle is sometimes not to be found in the human subject.

The four flexors arise, the two first from the upper part of the tibia, or principal bone of the leg, and continuing fleshy about half-way down that limb, send off two round tendons, which pass under the inner ankle, and are inserted into the bones of the foot. The other two flexors of the foot arise from the superior part of the fibula or smaller bone of the leg, and sending off two round tendons, which pass under the outer ankle also, are inserted into the bones of the foot. These assist the former in bending the foot by drawing it upwards.

The toes have two extensors and three flexors. The first extensor arises from the upper part of the leg, and descending to the ankle, separates into four round tendons, which run forward upon the upper part of the foot, where they can be plainly felt; and are inserted into the four small toes to extend them. The other extensor arises from the heel, and running forward upon the foot, also divides into four tendons, to be inserted into the toes likewise, and to assist in extending them.

The flexors of the toes arise, the first from the under and back part of the heel, and passing forward along the sole of the foot, sends off four tendons to be inserted into the second row of bones of the four smaller toes. The second flexor arises from the back part of the tibia below its head, and descending the leg, passes at the inner ankle to run along the sole of the foot, on the middle of which it divides into four slender tendons, which perforate the former in the manner of those which bend the fingers; and extending beyond them are inserted into the extremities of the last joint of the four small toes. The third flexor assists the two former in bending the toes, and also draws them inwards. Besides these there are other small muscles which are situated upon the foot, and which with those coming from the leg to be inserted into the great toe, complete the movements of these parts.

Thus we see that the muscles or flesh cover and spread over the whole frame of bones; connecting and securing its different divisions and parts; and not only producing all its movements, but also giving to it fulness, shape, and beauty. We shall now speak of the motions of those muscles.

OF MUSCULAR MOTION.

Muscular motions are of three kinds; namely, voluntary, involuntary, and mixed. The voluntary motions of muscles are such as proceed from an immediate exercise of the will; thus the mind directs the arm to be raised or depressed, the knee to be bent, the tongue to move, &c. The involuntary motions of muscles are those which are performed by organs, seemingly of their own accord (but really by their proper stimuli), without any attention of the mind or consciousness of its active power; as the contraction and dilatation of the heart, arteries, veins, absorbents, stomach, &c. The mixed motions are those which are in fact under the control of the will, but which ordinarily act without the control of consciousness; as in the muscles of respiration, the intercostals, the abdominal muscles, and the diaphragm.

Motion, as we before observed, is produced by the muscle contracting both its ends towards the centre, when one end being fixed, the other is drawn towards the centre of motion, and with it the bone or any other part to which it is affixed; and thus by the co-operation of several muscles, not only a limb, but even the whole body is put into action. This is the case with all the muscles of voluntary motion; their fibres contract on the application of the nervous influence, and the whole muscle shortens itself; and on the same principle the other muscles perform involuntary motion. The heart, for instance, contracts from the stimulating properties of the blood; the arteries do the same, as do the absorbent vessels, by a similar action of their contents, and all those organs and parts which have the power of acting independent of the mind.

We may define all motion in animals then to be the contraction of the muscular fibre from the presence of some stimulating influence. But whence the muscular fibre derives this contractile power, and what is its nature, remains still a phenomenon that baffles inquiry.

The following explanations of Professor Dalton are exceedingly lucid and interesting:

ATTACHMENT AND MECHANISM OF THE MUSCLES.

"The muscles of the limbs are usually rather elongated in shape, and somewhat thinner at their two extremities than in the middle. At their upper extremities, as a general rule, they are quite closely attached to the bones; but at their lower extremities they become more slender and tapering, and run into somewhat long and narrow rounded cords of white fibrous tissue, which are called "sinews" or tendons. These tendons have no power of contraction like that of the muscular fibres, nor can they be stretched like the elastic ligaments of the spinal column; they are simply very strong and unyielding fibrous cords, by which the muscles are attached to the bones upon which they are to act. When a muscle contracts, accordingly, it draws upon the bone below, by means of the tendon which is inserted into it, exactly as a horse draws a loaded wagon by means of the leathern tugs and couplings of his harness.

"The tendons are usually inserted into the movable part of a limb, at a short distance below the joint. Accordingly, when the muscles contract, they act upon the limb with great rapidity; and a small amount of contraction in the muscle will move the farther extremity of the limb over a considerable distance. Thus the hand and arm are raised, in bending the elbow-joint, by the action of the flexor muscles situated on the front of the upper arm, above the elbow, called the biceps flexor and the brachialis anticus (Fig. 5). They arise from the bones of the shoulder and upper arm, whence their fibres pass in a downward direction, their tendons being finally inserted into the bones of the forearm just below the elbow-joint. When these muscles contract they draw the forearm upward, moving it upon the elbow-joint like a door upon its hinges, and thus raising any weight which is supported by the hand or wrist. The greater the weight which is to be lifted in this way, the greater the force which is exerted by the muscles; and they may be felt, accordingly, on the front of the upper arm, swelling and hardening at the moment of contraction exactly in proportion to the amount of strength put forth. The tendon of the biceps may also be felt at the same time, just in front of the elbow-joint, made tense and rigid like a bowstring by the action of the muscle above.

"Nearly all the movements of the body and limbs are performed by a mechanism like that just described. Whatever variations occur are mainly due to the different construction of the joints; for, while some of them, as the elbow-joint and the knee-joint, are so arranged that they can move only backward and forward like hinges, others, such as the shoulder and hip-joints, can be turned in various directions, or even carried round and round in a circle, or rotated by a kind of twisting motion, like the hand and forearm. But in all cases this is accomplished by the action of muscles, whose tendons are inserted into the bones in various directions, and which thus produce by their contraction the corresponding movements."

MOVEMENTS OF WALKING, RUNNING, AND LEAPING.

"The movements of walking, running, leaping, etc., are performed as follows: When the body stands upright, the feet are planted flat upon the ground, bearing at once upon the heels behind and the ball of the toes in front, the weight of the body resting between the two, upon the middle of the arch of the foot. The body is maintained in this position, as we have seen, by the various muscles, which act in such a way as to keep its different parts carefully balanced, and to retain the weight of the whole suspended exactly over the ankle-joint.

"Now in walking, when a movement is to be executed in advance, the body is first made to lean a little forward, so that its weight no longer remains above the ankle, but is thrown forward so as to rest entirely upon the toes. The heel is then lifted from the ground by the action of the very strong muscles situated on the back part of the leg, called the gastrocnemius and soleus muscles. These muscles, which come down from above, form the fleshy mass which is known as the "calf of the leg." They terminate in a strong cord-like tendon, called the "Tendon of Achilles," which is easily felt at the back part of the ankle-joint, and which is attached to the projecting bone of the heel, termed the calcaneum. When these muscles contract, they draw the heel upward by means of the tendon inserted into it, and lift in this way the ankle-joint and the whole body, carrying it upward and forward, its principal weight resting, as already mentioned, over the ball of the toes.

"The action of the leg and foot, in this movement, is the same as that by which we might lift a weight from the ground with the aid of a lever. Suppose one end of a strong stick to rest upon the ground, and that this stick bears upon its middle a heavy weight. Then, by taking in the hand the other end of the stick, we may lift the weight exactly as the body is lifted, in walking, by the muscles of the leg and the ankle-bones.

"At the moment that the body is raised and tilted forward in this way, the other foot is lifted entirely from the ground and swung forward, so as to take a step in advance. As soon as the body has been carried far enough in an onward direction, the second foot is also raised in the same manner as before, while the first is swung forward in its turn to take another step. In this way the two legs act alternately, the weight of the body being carried forward first by one and then by the other; all the muscles, however, upon the two sides combining harmoniously in their action, so as to produce an easy, graceful, and continuous movement.

"In the act of walking, as above described, one foot is always upon the ground, and the weight of the body is mainly supported in this way by bearing upon the toes; it is only lifted forward alternately on the two sides by the leverage of the bones of the foot. Consequently no violent muscular exertion is required, and the movement can be kept up for a long time without fatigue.

"The act of running, however, instead of being a series of steps, is performed by a succession of leaps or springs, in each of which the whole body is thrown clear of the ground, and carried forward by the impetus which it has received. In order to accomplish this, at the moment the heel is about to be raised by the action of the muscles above described, the knee and hip-joints are first bent, and then instantly straightened by the sudden contraction of their extensor muscles. The whole limb thus acts like a powerful spring, which, by its sudden extension, throws the entire body off the ground and carries it through the air in an onward direction. The opposite limb is at the same time thrown forward to receive the weight of the body, and to perform, in its turn, and with similar rapidity, the same movements. The speed of the runner depends on the vigor of the muscular contractions, and the swiftness with which the successive motions are performed.

"The act of jumping is accomplished in a similar way with that of running, except that the same motions are executed by both limbs together, so that each leap is performed by itself, and is not combined with the others in a continuous movement."

EFFECTS OF NERVOUS INFLUENCE.

The nervous influence is a stimulus to the voluntary muscles, as blood is to the heart and arteries; food to the stomach; or bile to the intestines. It loses its influence over the system sooner than the irritable principle in the fibre fails; for the irritable state of the muscle continues long after the voluntary motion, or power of excitement from the nerves, is gone. If, while in perfect health, we are killed by a sudden blow, the irritable power of the muscles survives the nervous system many hours. It is this retention of the contractile power which fixes the dead body in whatever posture it is placed, and preserves freshness in the animal which seemed dead, but which is really dying still; for the moment this lingering portion of life is gone, the body dissolves and falls down; and so we judge of freshness by the rigidity of the flesh, and foresee approaching putrefaction by its becoming soft. There is no speedy putrefaction in creatures suddenly killed; in these the body continues fresh and susceptible to stimuli long after death. But if their contractile principle, this irritable nature of the muscular fibre, be exhausted before death, or in the moment of death, then does the body fall quickly into the condition of dead matter, passing through those changes which are the only sure indications of death. The fish which is allowed to struggle till it is dead, and which is not instantly killed, as in crimping; the ox overdriven before it is brought to the slaughter-house; the animal killed by lightning, which suddenly destroys all powers of life; in these the contractile power is effectually exhausted; no mark of irritability remains; and putrefaction comes quickly on. So is it also in those who die of the plague, of poison, of some fevers, or of any sudden and violent disease, which at once extinguishes life, in the common sense, and robs the system of that remnant of life which the physiologist could produce to view. In all these cases the body becomes putrid in a few hours. That a body becomes putrid so early in warm climates is not merely because putrefaction is favored by heat, but because heat extracts the vital power; and often a part of the body has lost its organized power, and is almost putrid, before the whole be dead. We find that we often err in this, that when a body has lost all feeling and motion, we pronounce it dead; the nerves indeed, have ceased to act and perform their office; all feeling and consciousness is gone; but the mere animal power survives the nerves, and through it the whole system may be recalled into perfect life; as after suffocation or drowning, we can by operating upon these poor remains of life, restore the circulation, reanimate the nervous system, and recover that life which seemed to have left the body.

The powers of the nervous system ought, however, to be justly estimated. The perfect animal feels and moves by means of the nerves, which at the same time convey the dictates of the will to the voluntary muscles, and unite every part into a perfect whole. But the muscles themselves are governed by laws of their own. The heart of the chick begins to move before we dare presume that there is any organ for distributing this nervous power. The punctum saliens is the heart of the chick; it is seen beating while the body of the chick is but a rude, unformed, and gelatinous mass; daily the active centre increases in strength and power; and it has a delicate feeling of stimuli, so that it quickly reacts, when they are applied to it. Its motions are excited by increased heat and languish when cold, till at last it dies. Then it ceases to act, but still heat restores it to life; and again, when we cut out the heart of a grown animal, so as to separate it from the nervous influence, it will for some time act on the application of stimuli, then appearing to have its power exhausted, it will lie dead for a while, till recovering that power, it will again act.

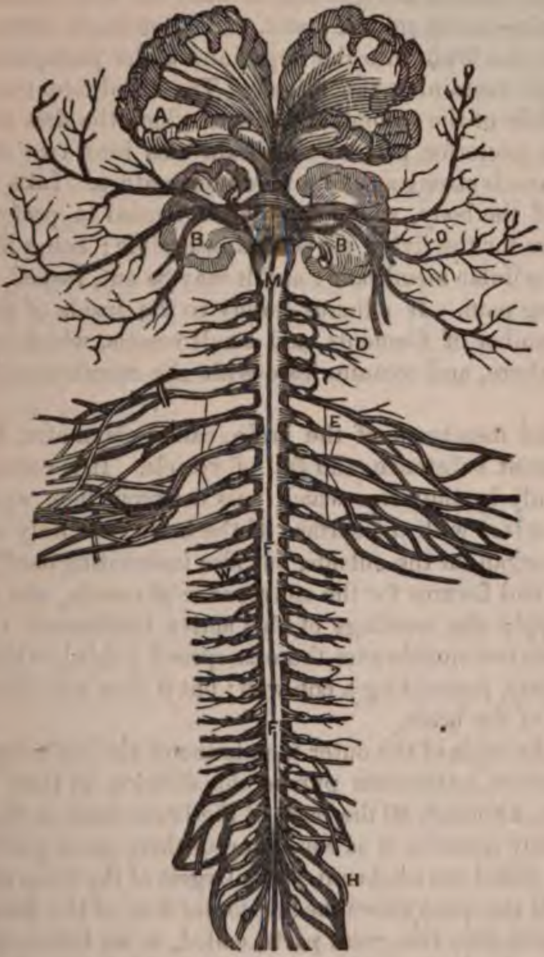
Sensibility, therefore, depends upon the nerves; but *motion*, upon the muscles. Both are equally admirable and inscrutable; the one conduces to all the enjoyments, and all the sufferings of life, and to the intellectual faculties of man; the other is the chief support of animal life, and the source of all the bodily powers. And here we cannot refrain from contemplating this living power. The genius of man has invented pulleys and levers to accelerate motion; and has enabled him even to anticipate all the mechanical helps which he has found in the mechanism of the human body. But, compared to the lowest creature, animated with the living principle, the proudest works of his hands are but as dead matter. In the most perfect machines no new power is acquired; if there is any acquisition of force, there is a proportionate loss of time; while in muscular contraction, which is the immediate source of power in animals, there is a real increase of power without any loss of time.

THE BRAIN AND NERVES.

1. THE BRAIN.

We now come to those organs which endow the human body with feeling; cause all the voluntary motions; and afford a fit residence for the soul. We shall first describe them anatomically, and afterwards speak of their nature and properties.

The brain is a soft pulpy mass of a whitish color on the inside, but grayish exteriorly. It occupies all that cavity which is formed by the bones of the skull; and is surrounded by two membranes; the first or outermost of which is called the dura mater, which lines the inside of the skull, and prevents its eminences from giving injury to the delicate structure of the brain. This membrane also serves another useful purpose; it helps to prevent concussions of this organ; for, sending off large folds which enter between the divisions of the brain, it separates the whole mass into portions, which by its partitions it supports and protects from pressure, in the different motions and positions of the head. Three of those partitions are considerable. The first commences at the inside of the forehead, and running along the roof of the skull, descends to about the centre of the



EXPLANATION OF FIGURE II.

This Plate shows the Nervous System; consisting of the Brain, Spinal Cord, and Nerves. The brain gives origin to nine pairs of nerves; and the spinal cord, connected with the brain, gives off thirty-one pairs. There are, properly, two brains; the large brain, occupying the upper and front part of the skull, and the small brain which occupies the posterior and base of the skull.

A. A. The two halves of the Large Brain.
B. B. The two halves of the Small Brain.
F. F. Spinal Cord, joined to the Large Brain.
O. Branches of the Fifth Nerve going to the face, teeth, and eye.
E. Five nerves forming the Brachial Plexus, and going to supply the arms and hands.
W. Branches of the Dorsal, or Nerves of the Back. Those near the lower F. are the Nerves of the Loins.
H. Sacra. Nerves, going to the thighs, legs, and feet.

back-part of the head. It divides the upper part of the brain into two great portions, called hemispheres. The second partition runs horizontally, or nearly at right angles with the first, whose termination it receives at its middle; and, extending itself towards each ear, it divides the brain into the upper and under parts, thus forming a floor for sustaining the former. The third fold runs down from the middle of the second, opposite to where the first ends, and separates the posterior part of the brain also into two divisions. This membrane is strong and of a tendinous nature. Like all other membranes of the body, which are only intended to perform subservient offices for the living parts, it is insensible; being like them composed of cellular membrane; and it may be cut, rasped, or torn, without giving pain. It adheres closely to the inside of the skull, by a great number of filaments, and small vessels, which enter the bones everywhere, and communicate with the membrane covering the skull.

The second membrane of the brain, called pia mater, is a soft, thin, transparent substance, and full of vessels. It is connected to the former only by the veins which pass between them, and lies in immediate contact with the surface of the brain, not only covering this delicate organ on the outside, but also insinuating itself into all its windings and fissures for the conveyance of vessels, and nourishment; to supply the wastings of this active intellectual machine. Between these two membranes there is spread a third, which is extremely delicate, resembling a cob-web; but it does not dip into the convolutions of the brain.

Because the folds of the outer membrane of the brain dip deeply into its substance, anatomists pursue this division in their description. Hence, although all the parts of the brain unite at the centre of its base, they describe it as consisting of three great portions.

The first, called the cerebrum, is the largest of the three divisions. It occupies all the space above the horizontal floor of the dura mater, and is separated into two great parts, called, as we before observed, hemispheres. Each hemisphere is again divided into three parts called lobes, and has several winding furrows on its surface. The substance of the cerebrum is grayish on the outside, but is white and firmer in texture within.

The cerebellum, or second division of the brain, lies under the former floor at the under and back part of the skull, and is also divided into two portions by the third or descending fold of the dura mater. It consists, like the first division, of a grayish and white substance; and has each portion or half, again divided into three bodies, but lacks the furrows on its surface.

The third division is called the medulla oblongata. It lies at the base of the skull, and is a continuation or union of the white substances of the other two divisions; being like these of a white color, and its consistence more firm than that of the grayish portion of the brain.

2. SPINAL CORD.

The spinal marrow, as it is called, is a continuation of this third division of the brain; it passes out of the head by the great opening of the skull, and running down the canal of the back-bone, where it is safely lodged, throws off nerves, till it reaches the pelvis, where (as was before said, when describing those parts) it separates into numerous thread-like nerves, resembling a horse's tail. The spinal marrow, like the brain, consists of a whitish and a grayish substance, and is covered and protected by a continuation of the membranes belonging to that organ.

3. NERVES.

The nerves arise from the brain and spinal marrow. They come out in pairs, and are distributed over the whole body. Forty pairs are counted in all. Of those, nine pairs arise from the base of the brain within the skull; a tenth from the brain, as it passes through the great hole of the skull into the spine; and the remaining thirty from the spinal marrow. Those arising from the brain pass through holes in the base of the skull, and are distributed chiefly to the organs situated in the head, and to those contained in the chest and belly; while the nerves which arise from the spinal marrow go, partly among the internal organs of the trunk, to be distributed principally to the exterior parts of the body, and to the extremities or limbs. All the nerves arise, first by medullary (or marrow-like) fibres, which afterwards meet, and form soft, white, pulpy cords. These cords run out in pairs from their origin; but soon afterwards separate, and spread themselves over the whole body, by dividing into innumerable branches.

1. SENSIBILITY.

The brain and nerves constitute the organs of sensation in the animal machine, and are

THE SOURCE OF SENSIBILITY TO OTHER PARTS.

All the other parts of the body derive their capability of sensation from the brain, the spinal marrow, and the nerves, being in themselves wholly insensible and incapable of feeling save as they have the nervous branches distributed to them.

That this is the case, is proved by the fact that if a nerve going to any part be tied, that part becomes immediately paralytic and insensible below the ligature, but will recover its powers on liberating the nerve.

The same thing is also proved by the fact that the degrees of sensibility of the different parts of the body are in proportion to the quantity of nervous branches which can be discovered to belong to such parts. Thus, while in some places we find a conflux of nerves forming the most delicate and perfect sense, and endowing that part with full life, there are other parts of the body, as the bones, cartilages, ligaments, and tendons, which, while they are almost destitute of nerves, are so insensible as to be cut, torn, or even totally destroyed without exciting pain.

2. SOURCE OF VOLUNTARY MOTION.

The excitement to all voluntary motion flows from the brain or spinal marrow, through the medium of the nerves, to those parts of the body which we wish to move.

That the immediate cause of all voluntary motion is the brain and spinal marrow, is seen by the fact that when the brain is seriously injured power of motion in the body is often lost.

If, for instance, the brain be compressed, either from a rush of blood, or water, or from other mechanical causes, the whole body will become paralyzed, and the power of motion suspended ; but, on removing the compressing cause, this paralysis will cease, and the whole frame will recover its power of sense and motion.

Compression of the spinal marrow will also cause loss of motion and sense, but only in those parts which receive their nerves from it, as the external flesh of the trunk of the body, and muscles of the limbs.

And if a nerve which conveys the immediate cause of motion from the brain, or spinal marrow, to the parts to be moved, be either cut or tied, or otherwise compressed, the part to which this nerve is distributed will immediately become insensible, and lose its power of motion. Thus injuries of particular nerves produce palsy of the parts to which those nerves are sent ; as loss of voice, hearing, and speech ; but on removing the cause, the disabled parts will recover their functions.

3. SEAT OF SENSATIONS.

The nerves are the *organs* and the brain the *receptacle* of all our sensations.

That sensation arises from an impression made on a nerve and conveyed by it to the brain, is proved by the following facts.

If a nerve be in any way irritated, a sharp sense of pain is immediately produced. The mind in the brain becomes instantly informed of the suffering, and efforts are made to relieve the part. But if that nerve be compressed above the seat of its irritation, so as to cut off the channel of communication between it and the brain; the mind is then no longer conscious of any irritation that is made below the point of compression; and the affected parts are reduced to a state of insensibility similar to that of parts which are destitute of nerves, and may be cut or destroyed without exciting pain. But, by removing the compression from the nerve, the parts below will recover their sensibility; the irritation will be felt anew; and the sensation of pain again propagated along the nerve to the brain, to inform the mind of the presence of an injury.

The reader should be here informed that each nerve issuing from the spinal marrow is divided into two distinct parts, or branches; each of which has its own special office. The anterior branch imparts motion; the posterior branch, sensation. Thus the cutting, or compressing by ligature, of the one, will paralyze the power of motion at that point in the system which it is designed to serve. The other, treated in the same manner, will fail of its office of sensation.

While the power of sensation is destroyed by the one operation, that of motion remains. So, while the power of motion is destroyed by the operation, that of sensation remains.

Now, pain is only the result of an impression made to excess; that is, a set of disagreeable sensations, produced by the too forcible contact of bodies with the organs of sense. It is wisely implanted in the human system to guard it against injury; for without it, the delicate structure of our frames would be almost continually liable to destruction from various bodies in nature around us. But as pain is the salutary consequence of excessive, so sensations without pain are the results of a due impression on our sensitive organs, from the objects which are calculated to influence us; and as long as the body remains in health in all its parts, these impressions will continue to cause sensations in the nerves; which, on their part, will forward them to the brain, where ideas of the nature and properties of the impressing objects will be instantly formed for the instruction of the mind. Thus the skin and other parts possessed of what is generally called feeling, will be susceptible of touch, and communicate to the mind in the brain, the sensations of the hardness or softness, the roughness or smoothness, &c., of such bodies as may be brought in contact with it; while the organs of the other senses, as the eye, ear, nose, and palate, being differently and more highly organized than the skin (though deriving their sentient powers from the same source as the latter, namely, the nerves), are enabled, by their regular structure, to receive different kinds of impressions, each according to its properties and conformation. The eye will be impressed from light, the ear from sound, the nose from smell, and the palate from taste; and by those various impressions an extensive and varied knowledge will be transmitted to the mind, in the brain, of the nature of the objects in correspondence without.

That the brain not only collects, but also preserves the sensations to an indefinite length of time, is seen in the astonishing strength of the memory of some individuals.

That the brain is the seat of ideas any one may convince himself, by shutting his eyes for a moment, to exclude the influence of present objects, when he may figure in his mind the exact likeness of some dead or absent friend, of a favorite horse or dog, or of any other familiar object.

RELATION OF MIND TO MATTER—THE BRAIN THE ORGAN OF THE MIND.

Although the relation of matter to spirit is one that has engaged the attention of philosophers from the earliest ages, it was not until quite recently that we were able to prove even approximately that the brain was the material organ through which the soul acts. In the time of Plato and Aristotle, dissection of human bodies was a crime; and even within the last twenty-five years, it has been looked upon with disfavor by legislators and by the people. But in spite of prejudices and opposition, physiologists have persevered in their labors, and after centuries of study over the bodies of men and of the lower animals, supplemented by the close and partial researches of modern theorists and microscopists, we are now able to state with positiveness that the brain is the organ of the mind, just as decidedly as that the digestive apparatus is the organ of digestion. Although investigations on this subject have not ceased, are indeed yet in the height of their activity, it is yet sufficiently demonstrated that the mental, moral, and emotional nature of any being depend on the *quantity* and *quality* of his brain.

By quantity of the brain, I mean its weight in pounds and ounces; by quality, I mean the character of its structure—whether fine or coarse, simple or complex, and so forth. Brains that are of the same size and weight may differ very widely in the number of their folds or convolutions, the relative proportion of white and gray matter, the number and shape of their cells or fibres, and in their intimate chemical structure. All these factors taken together make up what I term the *quality* of the brain.

The conclusion that the immaterial part of our nature acts through the substance of the brain, and in the character of its manifestations depends on the quantity and quality of the cerebral substance, is mainly derived from the following arguments :

1. *From the comparative anatomy of man and animals.*—From those types of animals in which the cerebral hemispheres begin to appear, through all the grades—fish, birds, dogs, horses, apes, gorillas—up to the creation of man, we find that the intelligence bears a decided relation to the quantity and quality of the brain. (See the chapter on *Man Compared with other Animals.*)

The relative size of the brain, as compared with the body, is also an important factor in estimating the intelligence. The *whale* and the *elephant* are the only animals that have larger brains than man. But the brains of these animals are far inferior in *quality* to those of man, are moreover of less *relative* weight, and therefore have far less capacity for manifesting intelligence. The brains of gorillas and of the man-like apes—the most intelligent orders of animals below man—are inferior to the human standard not only in quality, but also in quantity. The most intelligent apes or gorillas have less weight of brain than the average of human idiots.

2. *From the comparative anatomy of the different races.*—The contents of the cranial cavity are determined in two ways—by weight and by measurement in cubic inches. The lamented Dr. Morton, who devoted a laborious lifetime to this investigation, found the cranial capacity of the Germans, English, and Anglo-Americans to be 92 cubic inches ; of the Celtic, 87 cubic inches ; of the Malays, 85 cubic inches ; of the Chinese, 82 cubic inches ; of the American negro, 83 ; of the American Indian, 84 ; of the Toltecan Indian, 77 ; of the Hottentots and Australians (the lowest) 75 cubic inches. It will be observed that these measurements correspond to the relative intelligence of these races as recognized by history.

Dr. J. B. Davis, Tiedman, Dr. Ira Russell, and other observers, both in this country and in Europe, have arrived at substantially the same conclusions as Dr. Morton, though by comparing the weight rather than the cubic measurements of the brain. From the researches of Dr. Russell it would seem that when negroes and whites amalgamate, the weight of the brain tends to diminish below the standard of the black race.

3. *From the comparative anatomy of the sexes.*—Women have on the average *five ounces less brain* than men. This difference in quantity is to a certain extent made up by the superior quality of the feminine brain. Women are usually more finely organized than men. High organization is generally accompanied by a correspondingly fine quality of brain. A moderately sized brain of a fine quality is oftentimes far superior, particularly in special aptitudes, to a larger brain of coarse quality. Therefore woman, though more or less subject to man, is oftentimes his equal, and in some particulars incomparably his superior.

4. *From the comparative anatomy of individuals in the various grades of intellectuality.*—The brains of really great men are always superior to those of average humanity, in quality or quantity, or in both. The brain of Daniel Webster measured 122 cubic inches, and the gray matter, on which thought more particularly depends, was of remarkable thickness. The brain of Cuvier was also remarkably large. It is probable that in coming time chemistry and the microscope will be able to detect even the very minute shades of difference between the various orders of intellect simply by microscopical and chemical examination of the brain after death.

5. *From the fact that morbid changes in the brain always accompany mental disease, such as idiocy and insanity.*—It is only quite recently that physicians have been able to say with certainty that every case of absolute insanity is caused by some disease of the brain. From the researches of Prof. Schroeder Van der Kolk, who has devoted over a quarter of a century to this subject, and also of other observers, it is clear that there can be no mental disease, without some corresponding morbid change in the brain. Careful and repeated observations have also shown that the percentage of phosphorus is less in idiots than in the healthy, less in infancy and the decline of old age than in adult life. It has also been ascertained that other constituents of the brain are more or less modified by disease either in quantity or quality. It is logically probable, though not directly established, that the slightest forms of mental disease, the mildest stages of idiocy, hypochondriasis, melancholy, dementia, or imbecility are but the symptoms and results of *correspondingly slight morbid changes in the brain.*

On the other hand it is well established that there can be no important injury of the brain without a corresponding impairment of the intellect. Excess or deficiency of blood in the cranium, pressure of pieces of bone, or other foreign substances on the brain, the concussion of a blow or fall, will cause either temporary or permanent injury to the mind, such as is not observed when other parts of the body are similarly affected.

There are degrees and stages in the diseases of the brain, just as there are degrees and stages of the diseases of any other organ, and the conclusion is logical and inevitable, that the slightest forms of mental or nervous derangement are but the symptoms and expressions of corresponding slight disturbances of the central nervous system. The present prospects are that the microscope and chemistry will establish this question beyond a doubt. On the other hand it is established, by logical probability, that disease of any other organ, however severe or long-continued, never produces mental derangement without first inducing disease of the brain.

6. *From our knowledge of the minute anatomy of the brain as revealed by the microscope and chemistry.*—According to Lockart Clarke—a high authority on this subject—the convolutions of the human brain consist of *eight* distinct concentric layers. These are formed of very fine fibres, and of cells in an *infinite* variety, lying very closely together. Under a very close examination it is seen that there are an *infinite* number of communications between an *infinite* multitude of cells, of an *infinite* variety of forms. These cells vary in diameter between the $\frac{1}{2000}$ to $\frac{1}{300}$ of an inch, and in shape may be pyramidal, pyriform, triangular, round, oval, or fusiform.

Macaulay finely compares the mind of Bacon to the tent which the fairy Peibanon gave to Prince Ahmed, "Fold it, and it seemed the toy for the hand of a lady; spread it, and the armies of powerful sultans might repose beneath its shade."

In view of what is now known of the wonderfully complex anatomy of the human brain, we see that this happy comparison may with full justice be applied to every intelligent being.

Chemistry has shown that the proportions of the solid constituents of the brain, and especially of phosphorus, vary with the intelligence in different individuals, and in the same individual at different epochs of life, being least in infancy and the decline of old age, and greatest at maturity.

7. *From the fact that after intellectual labor an increase of alkaline phosphates is detected in the urine.*—We have already stated that phosphorus is an important constituent of the healthy brain. We believe that all of our physiological psychologists would substantially endorse the bold declaration of a recent German writer, "*ohne Phosphor kein Gedanke*"—no thought without phosphorus.

The phosphates that are found in the urine after intellectual labor are the products of the metamorphosis of the tissues of the brain. Dr. H. Byasson, in a recent pamphlet on this subject, states, that "Provided a man should be subjected for three days to a uniform diet, and placed under nearly similar external circumstances, it would be possible to determine, by analysis of urine alone, which day had been passed in repose, and which had been spent in physical or mental exertion." We hold that every intellectual act, from the meanest to the most exalted, is attended by a corresponding metamorphosis of nerve-tissue. It has been found by chemical analysis of the *extractives* of nerves that their functional activity is accompanied by definite change or waste of tissue, closely resembling that which is observed in muscles after they have been thrown into activity.

The logical conclusion is inevitable, that for all the phases of intellectual activity—the cool calculation of the man of sense and the wild frenzy of the poet—the hate of the ruffian and the affection of the maiden—for the lightest whisper of fancy, and the weightiest toil of reason—for the oath that falls from the reprobate and for the prayer that breathes from the heart of the devotee—for all thought, all will, all emotion, there is a corresponding change and waste of tissue in the brain, of which the mind is the function.

8. *From the facts already established in regard to the Correlation and Conservation of Forces* (see chapter on "Life").—The known and familiar forces—light, heat, electricity, magnetism, and motion—are correlated to each other, and, so far as experiments are able to show, no force is ever annihilated. From these known facts, that to a certain extent are visible to sense-perception, we may rise toward the unknown, and by logical probability we may arrive at the grand conception that the soul of every man is correlated to all the other known forces of the body—heat, electricity, magnetism, nervous force, and motion—and that the Creator himself is correlated to his entire creation.

This theory harmonizes with our intuitive ideas in regard to the immortality of the soul and the existence of a God. If none of the forces are ever annihilated, but are correlated to and persist in each other, the soul, if it be correlated to the other forces of the body, can never *be annihilated, but must be immortal.* For the same reason God himself must be eternal.

We already know that the human body contains several forces that are correlated to each other. Why may it not contain other forces still? Beside electricity, magnetism, heat and motion, why may it not contain nervous force and a soul, and why may not all be correlated to each other? According to Prof. Helmholtz, it ap pears that the rate of travel of the nervous force can be measured with perfect accuracy. He has ascertained, by means of the chronoscope, that the rapidity of the nervous force varies in different individuals, but that its average speed is 97.1 feet a second; in the active and nervous it moves more rapidly than in the cold and phlegmatic. Those experiments may lead to important discoveries.

This doctrine, and *the facts* of the correlation and conservation of forces, are of vast import and of profound significance.

9. *From the observed facts of our common, every-day experience.*—Every studious school-boy knows that after working hard and long over any knotty problem, the head becomes more tired than any other portion of the body. When we wish to recall an idea or to start a train of thought, how often do we involuntarily scratch the head or rap the brows. The common expression, "the eyes are the mirrors of the soul," is as true scientifically as it is metaphorically. The optic nerve which expands on the retina comes directly from the central nervous system, and is in fact a process of the brain itself. Therefore the eye becomes necessarily a revealer of the inmost workings of the brain—of the secret thoughts and emotions that we would not presume to speak of with our lips —and even of those feelings and sentiments that we most earnestly strive to conceal. All persons who are subject to headache know that it interferes with the intellectual processes far more than most severe pain in any other part of the body, and in some cases renders mental exertion impossible.

That alcohol, opium, hashish, and other poisons which affect the brain, also craze or stupefy the intellect; that all fevers which, as the expression is, "go to the brain," render the patient delirious or positively unconscious; that starvation of the body enfeebles or destroys the intellect—all these corroborative proofs of the dependence of mind on matter are so familiar that they hardly need to be mentioned.

The essential conditions for a *good memory* are these three:

1. *Natural endowment of brain.*—There are as many different kinds of memory as there are different kinds of talent among men, and all are as much dependent on the brain for their existence as digestion is dependent on the apparatus of digestion, or respiration on the lungs.

The intellect is the function of the brain. Memory is one of the faculties of the intellect. Therefore memory is one of the functions of the brain, and in its quantity and quality must correspond to the quantity and quality of the cerebral substance.

2. *Careful and special training.*

3. *A healthy brain.*—The soul acting on the brain produces memory, and all the other faculties of the intellect, just as when acting upon the digestive organs it produces digestion.

If the organs of digestion are sound, the digestion will be good, though all the rest of the body is saturated with disease. Just so, if the brain be sound, the memory will be good (so far as its natural or acquired capacities will admit), even though every other organ of the body is in a morbid condition.

It is true that disease of any part of the body may impair the digestion, but only by sympathetic or reflex action, and probably not until it has communicated a morbid condition to the organs of digestion. Just so, disease of any part of the body may impair the memory, but not until by sympathetic or reflex action it has given rise to some morbid condition of the brain.

There is no question that the word "functional," which at best is a mere cover for our ignorance, must in time be gradually discarded as that ignorance grows less.

The lungs may be hollowed by wasting tubercles, the liver may be eaten by cancer, the function of digestion may be attended with perpetual distress, and the conscience may be harrowed by remorse, or seared as with a hot iron, and yet the memory and all the other faculties of the intellect remain clear and unimpaired.

On the other hand, the slightest effusion of blood in the brain, and even a congestion or molecular disturbance of the hemispheres, may destroy the entire memory, or some special phase of it, for a lifetime.

Coleridge says that a "sound logic, healthy digestion, and a quiet conscience, are the proper conditions of memory."

This remark of Coleridge was recorded in the times of men's ignorance, and is not worthy of our day, nor of modern science. As a scientific explanation it is of about as much value as the semi-witticism that Emerson quotes so approvingly: The man who has a diseased liver is a Presbyterian, while he in whom this organ is healthy is a Unitarian. These generalizations are the relics of dark eras, when even physicians did not know whether the intellect was located in the head or in the abdomen, and when diseases of the organs of digestion were supposed to be the direct causes of diseases of the mental, moral, and emotional nature.

It is only indirectly, and probably by first inducing disease of the brain, that indigestion can affect the memory, or any of the intellectual faculties.

PHRENOLOGY.

In the light of these facts, we find it a not very difficult task to distinguish the true from the false in what is commonly known as *Phrenology*. Cranioscopy, *or the examination of the head*, informs us with considerable accuracy of two particulars only.

In the first place, it informs us of the *quantity* of the brain Although in some exceptional cases the skull is developed out of proportion to the cerebral substance—although in some few cases of disease the size of the head gives no indication of the size of the brain, and although the frontal sinuses interfere very seriously with the examination of a certain limited portion of the forehead, yet it is unquestionably true that, as a rule, the exterior surface of the skull corresponds to the *quantity* of the cranial contents.

In the second place, *Cranioscopy* informs us in regard to the *relative* development of the different regions of the brain. Although the divisions and subdivisions of the head that have been mapped out by phrenologists, and about which charlatans talk and lecture, are far from being scientifically demonstrated, yet it is now quite generally conceded among those who have given special attention to this subject that the anterior lobes of the brain are the organs of the pure intellect and reason, the posterior lobes of the passions and propelling powers, and the upper portion of the moral faculties. *It is furthermore conceded that it is entirely probable and consistent with analogy, and with what we know of the brain, that its various faculties may all be separately localized to even a greater extent than has been claimed by phrenologists.*

On the other hand, examination of the exterior of the head gives us no information whatever in regard to *two* vitally important factors, a knowledge of which is indispensable when we attempt to estimate character by the study of the brain.

First: it does not inform us in regard to the *quality* of the brain. The intellect depends on the number and depth of the convolutions, the thickness of the gray matter, the number and shape of the cells and the method of their arrangement, and also on the nature of the cerebral substance—in a word, on all those elements that make up what I call the *quality* of the brain. *It is obvious that examination of the head can give us no information in regard to these elements of quality, upon which the intellect depends as much as on the quantity, and in special aptitudes even more.*

Secondly: *examination of the head does not tell us how much a brain has been educated and trained.* A small brain that has been long and elaborately disciplined, that has been stored with knowledge and fortified by experience, that has acquired tone and vigor and elasticity by systematic activity, through a responsible and industrious lifetime, may be, and often is, far superior in every intellectual attribute to even a very large brain that has been suffered to vegetate in ignorance and inactivity, that has never been trained to bear responsibility, to originate thought or to experience emotion. It is true that education and the discipline of activity do cause the brain to grow in size, and therefore to make the skull larger, but only within certain limits. The brain, in this respect, follows the analogy of the muscles, but probably to a less degree.

If the human arm were covered with unyielding bone, like the brain, we could judge no more of its muscles by exterior examination than we now can of the brain. We could ascertain the *size* of the arm, and the relative size of its main divisions. But of the *quality* of the arm—whether muscle or fatty matter, coarse or fine, flabby or wiry—of the extent of training, gymnastic or pugilistic, to which it had been subjected, exterior examination could teach us little more than it can of the brain.

It is manifest, therefore, that *Cranioscopy* must be a very uncertain method of ascertaining character. It must necessarily teach more of error than of truth. It is in the very nature of things impossible that it should ever become an *exact* science. Even if future investigations should entirely confirm what has been so long assumed, in regard to the localization of special faculties—which is by no means impossible—yet, for the reasons already given, Cranioscopy can never rise to the dignity even of an approximately exact method of determining character. No advance in science can ever make it possible to ascertain the quality of the brain, or the amount of culture it has received, from external manipulation of the skull.

But though Phrenology must, in the very nature of things, ever be unmathematical and uncertain in its teachings, it is yet worthy of attention, chiefly because of what it suggests on this important theme, of the relation of mind to matter. In connection with Physiognomy—which, from the anatomical fact of the direct connection of the face with the brain by numerous and complicated nerves, is our best method of studying the character—and also with the science of Physiology, it becomes a most valuable and suggestive aid to the metaphysician, the man of the world, and the philosopher of human nature.

The fact of the dependence of the mental, moral, and emotional nature on a material organ, in no way destroys or modifies human responsibility. Man is just as much a free moral agent whether his mental and emotional nature depend on a single material organ like the brain, or the system at large, as Hamilton believes, or on no visible or tangible medium whatever. As a matter of experience, we all know that men differ in their mental and moral endowments just as they differ in their physical capacities;—that there is even a wider range in the powers of thought and feeling among different individuals and races of men than in their physical endurance and muscular strength;—that every man is as free to think and to feel as he is to act and to move, and is morally responsible according to the extent of the capacity of his mental and emotional, as of his physical powers.

FUNCTIONS OF SPECIAL PORTIONS OF THE BRAIN.

The cerebrum is the organ of the intellect. It is an interesting fact that it is not sensitive to pain from cutting or lacerating. The *cerebellum* is now supposed to be merely "*an additional generator of nervous power,—a ganglion to be added to the cerebrum*, and performing analogous *offices in the economy.*"

This is the view taken by Dr. Hammond, in a paper recently published on this subject. It was formerly supposed that the cerebellum was the organ of *amativeness.* This was the view of Gall, the founder of Phrenology.

Then, again, the cerebellum was regarded as the seat of *co-ordinating* power. That view also has been abandoned.

Numerous experiments have been made on animals with a view to settle this question, and yet it remains undecided.

It may here be remarked that many of the conclusions of Physiology have been derived from experiments made on animals. *It is, however, erroneous to suppose that animals are always tortured by these experiments.*

Since the discovery of the anæsthetic properties of ether and chloroform, it is possible to experiment freely on animals without inflicting pain. If Mr. Bergh, the noble President of the Society for the Prevention of Cruelty to Animals, had been as well informed in matters of science as in questions of philanthropy, he would never have attempted to interfere with the studies of physiologists.

TUBER ANNULARE.

This is the seat of *will.* Impulsive, instinctive, voluntary movements have their seat in this ganglion. If we see a bull running after us, we instinctively and without any process of reasoning hasten to get out of the way. This attempt to escape comes from the *tuber annulare.*

MEDULLA OBLONGATA.

This organ presides over *breathing or respiration.* This function is not under the control of the will. The cerebrum, the cerebellum, and the *tuber annulare* may be destroyed, and yet the breathing may go on as well as ever. Destroy or injure seriously the *medulla oblongata* and respiration is at once suspended.

Nature provides for the security of this organ by placing it within and under the brain, so that it may be less liable to injury.

REFLEX ACTION OF THE NERVOUS CENTRES.

When an excitation is received by the nerves, at any part of the body, the stimulus may be conveyed to the central nervous system, and thence transmitted to some other portion of the body. This is what is known by *reflex action.* This is the great fact with reference to the nervous system. By this power it presides over and regulates the whole body. The *spinal cord* has this power above and without the aid of the brain. By means of this reflex power of the nervous centres, injury or disease of one part may give rise to disease of another. Many of our paralyses are caused by reflex action. Little children often become paralyzed in an arm or leg by reflex action from the irritation of worms in the bowels, or from other causes.

6. DIFFERENT PARTS POSSESS DIFFERENT DEGREES OF SENSIBILITY.

Thus we see that the brain, spinal marrow, and nerves alone constitute the sensitive or feeling part of the human system; and that all its other parts, being composed of matter totally insensible in itself, are possessed of the capability of feeling only in proportion as they receive the branches of nerves. Hence, there is a gradation of feeling throughout the whole body, each of its organs and parts being endowed with that precise degree of sense which will be sufficient for the performance of its function in the living machine. The cellular membrane, for instance, whose office it is to unite into one whole all the moving parts of the system, is without feeling, being insensible to stimuli. This also is the case with the coverings of the brain, the coats of the nerves, the sheaths of muscles, of tendons, ligaments, and all the apparatus of joints, together with the substance of the tendons and ligaments themselves; for these parts, performing only subservient offices to the living organs, would derange the whole system by being possessed of a sensibility which would leave them no longer capable of bearing the friction, straining, shocks, and blows which they now endure without injury in the different movements of the frame. The feeling of bones is decided. They certainly do not send the sensation to the brain; but in their diseases, as in wounds of joints, &c., the great pain which the patient suffers, evidently shows them to be then not insensible. The muscles are all endowed with the sense of feeling, by a distribution of the nervous fibre everywhere throughout their substance. This is necessary to their office. As agents of voluntary motion, they must be capable of receiving and obeying the commands of the will; and they are so. Hence, the mind no sooner wills an act than the command flies along the nerve to the part to be moved, and the action is instantly performed. This dispatch is illustrated in the rapid movements of an opera dancer, every one of which were resolved upon in the mind before they could have been executed by the feet; and at least as strikingly in the organs of speech, by which *two thousand* letters can be pronounced in a minute, each requiring a distinct and successive contraction of many muscles. The skin possesses a finer degree of sense than the flesh, being fuller of nervous branches; and, rising in the scale of sensibility, may be said to form the lowest of the organs of the senses. Feeling is the property and use of the skin of the human body, which enjoys it over its whole surface, but more exquisitely in some parts than in others. Thus, while the greater part of the skin possesses it in a degree sufficient only to guard the body from danger, by warning it of the contact of substances which might be injurious, there are other parts, as the palm of the hand and sole of the foot, which are endowed with a greater sensibility, so much as, on a slight friction, to create a tickling kind of pleasure, and in some persons involuntary laughter. But this sense exists in a higher degree at the *points of the fingers*, which, from their convexity, are particularly adapted to be the organs of touch. The tongue, the organ of taste, possesses this sensibility in a higher degree still; for though it judges of the substances which constitute our food, by the same process as that used by the fingers—namely, contact—yet the latter with their finest feeling would be inadequate to discover bodies by their flavor. A step higher may be ranked the organ of smelling. The nose is so acute in its sense, as to be impressed by the light and volatile effluvia rising from bodies and floating in the air, and can consequently distinguish substances at a considerable distance. Higher again stands the sensitive faculty of the ear. This organ is qualified to be acted upon by the mere vibrations of the air, which, striking against this delicate part of our mechanism, produce sounds, and afford us information of things occurring at a great distance. But the most acute sense, and ranking, perhaps, next to the more simple operations of the mind, is that of sight. The eye, the beautiful organ of this power, is a type of its functions. In transparency, delicacy, and brilliancy it surpasses all other parts of the body, appearing to lose the grosser characteristics of animal matter, and to approach the nature of the mind, to which it serves as the most useful, rapid, and extensive messenger for procuring knowledge of the various objects around us.

Such is the varied distribution of sense which we see the brain and nerve bestowing upon the other parts of the frame. We are familiar with its uses. We know the kinds of bodies which are calculated to impress the different organs, and even the manner in which those bodies effect their impressions. And further, we can define and trace the limits of the senses themselves. For instance, we can determine the extent of vision, hearing, &c.; but, when we ascend one step higher in our researches, and inquire into the intimate structure of the brain and its operations, the more we are lost in wonder and admiration of this astonishing part of our system.

THE GREAT SYMPATHETIC NERVE.

The name has been given to a chain of nervous knots, or ganglia, which extend along the front and sides of the spine. These ganglia or knots are connected by small fibres; each one of them is also connected with the nerves that come from the cerebro-spinal system. The nerves of the great sympathetic are distributed to the stomach, the kidneys, the liver, the intestines, the heart, and other organs which are not under the control of the will.

There are four of these ganglia or knots in the head. One of these is called the *ophthalmic ganglion*, and is situated in the orbit of the eye. This nerve probably has something to do with *sick head-ache*, for the pain in that affection is often felt through the eye. One of the other ganglia is called the *otic ganglion*, and is found near the base of the skull. This nerve has something to do with hearing.

In the neck, the great sympathetic has two or three *ganglia.* These are closely connected with each other, and with the spinal cord. It has also ganglia in the chest, that connect with the nerves that go to the heart and lungs, and ganglia in the abdomen that form the *solar plexus*, which is perhaps the most important part of the great sympathetic. In the pelvis the sympathetic has also several ganglia. Two of these supply the genital organs.

All these ganglia are connected with each other, with the cerebro-spinal system, and with the internal organs of the body.

FUNCTIONS OF THE SYMPATHETIC NERVE.

We know much less of this sympathetic system than of the cerebro-spinal axis. There are great difficulties in the way of studying it.

There are three kinds of *reflex* action that are produced by the sympathetic system.

1. *From the internal organs to the surface and to the muscles.*—It is through the sympathetic system that indigestion, constipation, diseases of the liver, worms, and so forth, cause convulsions in children and that the same diseases produce headache in grown people.

The truth probably is, that most of our headaches and backaches are caused by the reflex action of this sympathetic system.

2. *From the surfaces and extremities to the internal organs.*—We all know by experience that wet feet cause us to take cold, often bring on a headache, or an attack of diarrhœa.

Mental and moral emotions, fear, joy, and so forth, affect the stomach, the liver, and the heart through the sympathetic.

It is the sympathetic system that causes us to blush. It may be said in general, that those who blush easily and deeply have a sympathetic system of peculiar sensitiveness. The sympathetic system is more sensitive in women than in men, in the finely organized than in those of an opposite temperament, in children than in adults. Under great mental excitement the cheek is often flushed, and the ears are red and warm. These symptoms are caused by the sympathetic system.

3. *From one internal organ to another.*—The stomach, the liver, the intestines, the heart, the brain, and the genital organs—all are apt to sympathize with each other in affliction. Diseases of the genital organs in male or female usually affect the stomach, or the brain, or the bowels through the sympathetic. It is for this reason, chiefly, that patients afflicted with even very slight disorders of the genital organs, are apt to suffer at the same time from mental depression and hypochondriasis, which they cannot throw off even with their utmost striving.

The sympathetic system is a kind of slow means of telegraphic communication between all the important organs of the body.

The lungs are not very liberally supplied from the sympathetic system, while the stomach is very abundantly supplied from the *solar plexus*, which is partly made up from the sympathetic. This accounts for the fact which we are all familiar with, that *consumptives* are usually in good spirits, even when in the last stages of the disease, while *dyspeptics* are frequently much depressed, and oftentimes exceedingly and unreasonably melancholy, even when their symptoms and pains are very slight and transient.

The sympathetic system works slower than the cerebro-spinal system. It frequently takes a long time for disease of any organ to affect another injuriously. A child may have worms for weeks and months before convulsions appear. A person may be dyspeptic for years before the intestines are affected and constipation or diarrhœa ensues. A person exposes himself to cold and dampness, and becomes chilled through and through. The next morning he awakes with a cold in his head, or a diarrhœa. The sympathetic system has brought on his bad symptoms, but several hours were necessary.

The sympathetic system has also important offices in connection with the eye, the ear, and the nose. These organs are provided with two sets of muscles—one deep, the other superficial. These muscles regulate the amount of sensation that these organs receive. The superficial muscles are supplied by the cerebro-spinal system, and the deep-seated by the sympathetic.

It is a very interesting fact connected with the sympathetic system, that if it be divided on one side of the neck there is an increase of temperature of the face on that side, and dilatation of the pupil. The same effect has been observed from injury to the sympathetic ganglion in the neck. The sympathetic nerve is probably much more at fault in many of our nervous diseases than is commonly supposed.

There is yet much room for study of the functions of the sympathetic, and it is to be hoped that in a few years our knowledge of this very important system will be greatly perfected.

THE SENSES AND THEIR ORGANS.

Next in order to the Brain and Nerves, come the Organs of the Senses.

We commence with the description of the eye.

DESCRIPTION OF THE EYE.

The eye is lodged, for its safety, in a socket formed partly by the bones of the skull, and partly by those of the face; and for the greater security of this delicate organ, it is defended on the outside by the eye-lids, which serve as an occasional covering against external bodies; while a fine, limpid fluid, secreted from a small gland, situated near the outer angle of the eye-lids, is constantly spread over the surface of the eye, to keep it moist and transparent; and to wash away those particles, which, floating in the air, might have attached themselves to this surface, and produced injury. This fluid, called the tears, afterwards passes off by two small openings at the opposite or inner angle of the eye; and thence descends by means of a canal, into the nose. The eye-lashes serve not only to protect the eye from insects and minute bodies; but also to moderate the action of the rays of light in their passage to the eye.

Each eye-ball is partly transparent and partly opaque. The former portion transmits the rays of light to the nerve spread at the back part of the eye; while the latter serves as a covering to this organ, and is intended also to confine the waters of the eye, and limit the passage of light. The opaque part consists; first, of the white outside coat which covers all the back part of the globe of the eye; and, running forward, joins its anterior edge to that of the transparent coat, called cornea, which is placed at the fore part of the eye. These two coats form the outside covering or case for containing the other parts of the eye, and from their difference of structure and use, are not inaptly compared to the outside case of a watch; the transparent coat answering to the glass, and the opaque one to the case into which it is fixed. It is the external part of this opaque coat which forms the white of the eye. Immediately upon the inner surface of this coat is spread the second coat, the choroid, which is also opaque; but being of a more delicate structure than the former it serves as a soft easy bed for the optic nerve to expand upon. This coat also runs forward towards the circular edge of the transparent part of the eye, and here its edges appear to be thrown off, to form a kind of curtain with an opening in the middle, the pupil, for the passage of the rays of light. This curtain is called the iris, and together with the choroid coat, of which it seems to be a continuation, owes its dark color to a black material called pigment, and which is spread more or less on the surfaces of these parts of the eye, for the purposes of accurate and distinct vision, by absorbing the superfluous rays. The optic nerve, descending directly from the brain, passes through an opening into the orbit, to enter the posterior side of the eye in a trunk, and is about the size of a goosequill. Having penetrated the coats

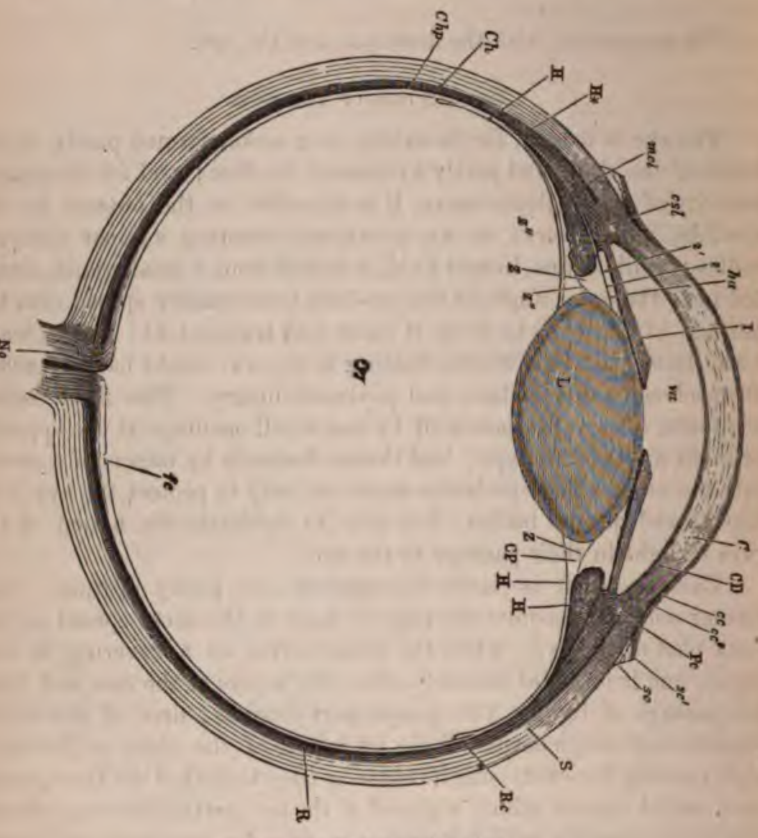


FIGURE OF THE EYE (*after Wells*).

S. Sclerotic.
C. Cornea.
Ch. Choroid.
Ch. p. Its pigment layer.
Pc. Ciliary processes.
m. ci. Ciliary muscle.
I. Iris. This is thinnest at its origin, becoming thicker toward the edge of the pupil, towards which it is bevelled off.

R. Retina.
No. Optic nerve.
H. Hyaloid.
L. Lens.
Cv. Vitreous humor.
va. Anterior chamber.
ha. Posterior chamber.

which we have described, it then expands into a very delicate membrane, lining the ball of the eye, for receiving the rays of light, which the transparent parts of the eye transmit to it. We will now describe those parts.

The lucid or transparent portion of the eye constitutes the principal share of this organ, and is composed of extremely fine membranes, and humors of a greater or less density. The first and principal membrane is that which we have compared to the glass of a watch, serving at the fore part of the eye as a covering to the parts within, and adapted also to transmit the rays of light. Immediately before the retina or expansion of the optic nerve, and occupying the posterior part of the eye, lies the vitreous humor, so called from its resemblance to fused glass. This humor consists of a fine clear liquid, contained within the very minute cells of a delicate membrane; and is a little hollowed at its fore part for lodging another humor, the crystalline, which is of a firmer texture, and of a lenticular (or double convex) shape. All the remaining space of the eye is filled with what is named the aqueous humor, because it is a thin, clear water, not contained within any cells, but lying immediately in contact with the coats and other parts of the eye. This fluid supports the convexity of the eye before, and will escape on puncturing the transparent cornea, which lies on its outside.

VISION.

Vision is effected by the eye through the medium of light, for the rays, passing directly from the objects which we behold to this organ, penetrate its transparent parts, till they fall upon and impress the retina or expanded nerve at the bottom of the eye. Now, the scope of vision being great, while the retina or seat of impression is but limited in size, it follows that objects can be painted only in miniature on this part, and that for this purpose its apparatus is necessary to converge the rays of light, so that they should convey a diminished figure of the object to the nerve of the eye. This is really and principally the use of the transparent humors of this organ. They refract and converge the rays of light in the manner of a camera obscura, which represents an artificial eye; so that a distinct image of the object we look at is formed at the bottom of the eye; and this point of convergence of the rays is called its focus. As in a camera obscura, so also on the retina, objects are painted in an inverted position. This happens from the necessary crossing of the rays in their passage to the nerve, and may be seen by cutting away the back part of the opaque coat of the eye, and placing a piece of paper to receive the object. Habit alone enables us to judge of the true situation, and likewise of the distance and magnitude of objects. To a young man who was born blind, and who was couched by Mr. Cheselden, every object (as he expressed himself) seemed to touch his eyes, as what he felt did his skin; and he thought no objects so agreeable to him as those which were smooth and regular, although for some time he could form no judgment of their shape, or guess what it was in any of them that was pleasing.

Eyes that are of a proper length bring the rays of light that come from distant objects (parallel rays) exactly to a focus on the retina, or on the screen which receives the image, without any effort. Rays that come from an object near at hand, a book which is being read, for instance, are divergent. Consequently an effort must be made to bring them to a focus. This effort is made by a little muscle inside the eye, which passes all around the ball, and is attached to the cornea, the iris, and the choroid coat. (The muscle may be seen in the cut.) This muscle acts on the lens of the eye, and causes it to become thicker in looking at near objects. Thus the divergent rays are also brought to a focus on the retina.

This act of adapting the eye to vision at different distances is called the act of accommodation. It is an act that takes place every time we turn the gaze from a near object to one that is more remote, and *vice versâ*. We are conscious of this movement going on within the eye-ball, and we may prove that it takes place by attempting to see two objects situated at different distances from the eye at the same instant of time. We are never able to do it. This action of accommodation is all done within the eye, by the ciliary muscle acting on the lens.

As life advances this muscle becomes weakened, and the lens becomes rigid. The muscle cannot then act as powerfully on the lens, consequently the rays from near objects cannot be exactly focused on the retina. The book must be held farther off, whence the rays are less divergent,—more nearly parallel. Finally, it must be held so far off that the image on the retina becomes too small to be perceived. This state of things is far-sightedness. It is relieved by putting a double convex lens in front of the eye, to compensate for the loss of power in the muscle to make the lens inside the eye as thick as is necessary. Placing a convex lens in front of the eye in effect lengthens the eye-ball.

Some eyes are born too short, and they require double convex glasses, just as those of old people do, as soon as they are used for reading, sewing, or the like. Their condition is essentially the same as that of the eyes of old people, although produced by a different cause. In the man of advanced years the rays cannot be focused, because the lens cannot be sufficiently altered, that is, made long enough, by the weakened muscle. In the child who needs convex glasses it is the whole eye-ball which is too short.

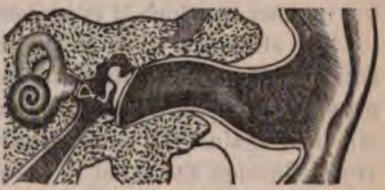
Other eyes are born too long. They are the so-called short-sighted eyes. They require dispersing or concave lenses in front of the eye, in order that vision for the distance may be distinct. Persons with eyes that are too long can usually read without glasses, because divergent rays, which always proceed from near objects, are focused on long eyes without difficulty. Placing concave lenses before eyes in effect shortens them, hence their use in looking at a distance. Some eye-balls are so unsymmetrical or irregular in shape, that they are too long in one meridian and of the proper length in others. This defect makes the vision indistinct at any distance. Such eyes require glasses which are ground from a cylinder—cylindrical glasses.

When eyes are so formed, or when they become so changed by age that glasses are required in order to distinct vision, they should be worn; a failure to employ them produces harm, and prevents the proper use of the eyes.

HEARING.

FIGURE OF THE EAR, SHOWING THE AUDITORY CANAL, THE DRUM, AND THE LITTLE BONES.

The internal ear, the immediate organ of hearing, is seated within the temporal bone of the skull, and consists of certain cavities, labyrinths, and passages, hollowed out of its substance; together with their fine lining membranes, some very minute bones, and the auditory nerve. The first passage is a canal of considerable length, which leads from the external to the internal ear. It is lined with a fine membrane, and is furnished with several small hairs for guarding the parts within from the entrance of insects. The inner extremity of this canal is closed by a thin transparent membrane, set in a bony circle like a drum-head. Under this membrane runs a branch of a nerve; and immediately beyond it lies a small cavity, called the drum of the ear. This cavity contains a chain formed by 3 small bones, which are furnished with muscles, cartilages, and regular articulations. It is of a hemispherical shape, and has four openings


EXTERNAL, INTERNAL, AND MIDDLE EAR, WITH DRUM AND LITTLE BONES.

from it; the first is a small canal communicating with the back-part of the mouth; the other three are holes which open into different recesses of the ear, and are covered with a very fine membrane. One of these openings directly leads through a bony partition, into what is called the labyrinth of the ear. This part of the organ of hearing consists, first, of an irregular cavity much smaller than the drum of the ear; next, of three semicircular canals, each of about a line, (the twelfth part of an inch) in diameter, which open by both their extremities into this cavity; and lastly, of a spiral canal, not unlike the shell of a snail, making two turns and a half from its base to its apex, and opening also into the former cavity. All these parts of the labyrinth are lined with a very fine membrane, and are filled with a watery fluid, which transmits to the nervous pulp in contact with it, the vibrations it receives from the membrane separating the labyrinth from the drum of the ear.

Owing to the situation, the variety, and the minuteness of the parts composing the ear, we do not know exactly the mode of action of this intricate but admirable organ. It is certain however, that the auditory nerve, which is distributed over the whole of the labyrinth, is the seat of the sense of hearing; and that a certain modulation of the air, collected by the funnel-like shape of the external ear, and conveyed through the first canal which we have described to the membrane, and thence communicating its vibrations to the nerve, is the cause of hearing. That sound is propagated to the ear by means of the air, is proved by ringing a bell under the receiver of an air-pump; the sound it affords being found to diminish gradually as the air becomes exhausted, till at length it ceases. We now describe the manner in which it is supposed that hearing is effected.

The stroke of some body against another, causes an undulating action in the surrounding air, not unlike to the circles which take place on throwing a stone into smooth water; and these waves of the air, beat against the external ear. Here they are collected and conveyed through the canal to the membrane closing the drum of the ear. This membrane they force into vibration, which is propagated onwards by the small bones in the drum of the ear, till it reaches the labyrinth, where communicating its impulse to the watery fluid contained in its cavities, the auditory nerve at length becomes affected by the tremor of the water, and the sense of sound is produced.

SMELLING.

The nose externally is constructed of bones, cartilages, small muscles, and the skin. Its internal part, which is the seat of smelling, has an extensive surface formed by the convolutions of four small bones; two in each nostril. A soft pulpy membrane covers them through all their windings, and upon this the branches of the olfactory or smelling nerve are copiously distributed.

Many cavities and recesses, formed in the bones of the skull, communicate with the nose, perhaps to increase the power of the organ, as well as to give distinctness and volume to the voice.

The sense of smelling is effected by the membrane before described. The subtile and invisible effluvia of bodies, being carried with the air in which they float, through the nose in inspiration, strike against the almost naked and soft olfactory nerves which are every where spread throughout this membrane, and are kept moist by a constant secretion of mucus, and produce in them a feeling, which we call smelling. This sense, besides adding to our pleasurable feelings, seems intended to direct us to a proper choice of aliments, warning us to avoid those which may be putrid or otherwise dangerous; and also admonishing us to avoid exhalations and vapors which render the air unhealthy. When we wish to take in much of the effluvia of anything, we naturally close the mouth, that all the air we inspire may pass through the nostrils, and at the same time, by means of the muscles of the nose, the nostrils are dilated, and a greater quantity of air is drawn into them.

THE TASTE.

Another sense which the all-wise Creator has given to assist us in the proper choice of food, and also for combining pleasure with the reception of nourishment, is that of taste. This property resides in the nervous extremities or papillæ, (minute terminations of the nerves) which lie upon the extremity and sides of the tongue. It is excited by the contact of those bodies, whose properties are fitted to act upon these nerves. Thus by making different kinds of impressions, owing to their various qualities, (some substances being mild, others acrid and pungent,) the different tastes of sour, sweet, austere, &c. are produced; but the particular state of these nervous papillæ, of the tongue, with respect to their moisture, their figure, and their covering, will produce a considerable difference in the exercise of this sense. Hence it varies in different people, and suffers great changes even in the same person, by sickness, and various other causes.

The ability of the tongue to distinguish tastes, has been providently implanted, that we may discern what food is most salutary. In general that which is so, is pleasant, and that which is ill-tasted is rarely fit for our nourishment. In this manner nature has invited us to take necessary food, as well by the pain called hunger, as by the pleasure arising from the sense of taste. Brute animals, governed by instinct merely, have the faculty of distinguishing flavors more accurately, by means of which they abstain cautiously from poisonous or unhealthy food. Thus herbiverous animals, to which many noxious plants are offered, are furnished with long and large papillæ in the tongue; which are not so necessary to man, whose reason and means of information serve, in part, instead of mere animal instinct.

TOUCH.

The sense of touch is that faculty by which we distinguish certain properties of bodies by the feel; and in a general acceptation, may, perhaps, be said to exist in all the parts of the body possessed of sensibility. But the term is commonly confined to the nervous extremities or papillæ of the skin, which being more numerous, or covered with thicker or thinner cuticle in some places than in others, give, as we before observed, a grosser or finer degree of feeling to the different parts. These papillæ are capable of being impressed by the exterior properties of bodies, whence the mind is enabled to form ideas of their solidity, moisture, inequality, smoothness, dryness, measure, fluidity, and heat. But the part of the skin which most possesses this sense for the examination of substances, is that covering the points of the fingers; which from the peculiar disposition of its nervous papillæ, and also from the convex shape of the part on which they lie, is admirably adapted for inquiring into the nature of bodies by the feel.

We have now rapidly described the senses and their organs. In each of the latter we have seen the nerve to be the seat of impression; and the organ itself to be an apparatus for conveying to the nerve a particular influence from the impressing object. Thus the transparent parts of the eye transmit the rays of light to the nerve which is spread behind them. The ear is adapted to collect, concentrate, and propagate the vibrations of sound, till they strike against the nerves distributed in the labyrinth. The nose, tongue, and fingers, are so constructed that the nerves, spread upon those parts, receive different kinds of impressions from contact, owing partly to the difference of the medium through which the nerves are acted upon; the membrane which covers them, being in some organs of a different structure, and in some of greater density than in others. Thus there is a common seat for impression in all the organs. The difference of sense is created by the organ itself, whose peculiar construction is fitted to receive only a particular influence from the impressing body. What admirable simplicity! and yet how astonishing are the operations of these beautiful parts of our mechanism.

THE FACE.

The features of the face viewed collectively present a striking and beautiful characteristic of the superior nature of man. Perhaps nothing in creation enjoys and expresses so many, various, and elevated influences as does the human countenance. It is the image of the soul, the place where its ideas, motions, &c. are chiefly set to view, and the seat of the principal organs of sense. To the countenance we naturally look in conversation for the full meaning of the words expressed. By it we are enabled to anticipate the emotions and feelings of others, before they yet reach the tongue. It speaks a language peculiar to itself, anticipating and outstripping all others in rapidity; which is general to all nations, and intelligible to every individual of the whole human race. Even brutes, whom man has domesticated and made his occasional companions, are not ignorant of this kind of expression. When the dog would know the commands of his master, unable to understand them in the complicated sounds of speech, he looks intently upon his face, and endeavors to collect thence his wishes and the disposition with which he regards him. Nor does this expression entirely forsake the face of man even in death. All the affections of the mind are more or less portrayed in turn in this limited but expressive field; love, pity, courage, fear, calmness, anger, and every other strong characteristic of the man.

To the size and proportion of the bones underneath, which constitute the base of the face, the difference of features is to be principally attributed. Youth, age, sickness, health, and even the stronger affections of the mind, have an effect in changing the countenance; but that diversity of feature consisting of the difference of length, breadth, or projection, depends chiefly upon the bony frame that lies below it.

From this difference of features, is that great diversity produced, which varies the countenances not only of nations, but of individuals; so that no two, perhaps, of the whole family of mankind, could be found exactly alike. But, notwithstanding this surprising diversity, we are not to suppose that the individual features composing each face are different from those of all other faces. We are rather led to believe, that each is capable of an indefinite number of combinations with other features; and that from a very few kinds of features, the astonishing and beautiful variety of faces we see round us are, by transposition, produced.

This supposition is supported by the simplicity of means which nature selects for effecting her purposes; and in a great degree by the likeness which often exists between two faces, sometimes so exact that one shall be mistaken for the other.

THE COMPLEXION.

It was not till lately that the true seat of the color of the skin became known. Previously anatomists supposed that color depended on the outer or scarf-skin. Malpighi, an eminent Italian physician, at length led to the knowledge of its true seat. He found that the skin of the human body consists of three parts, separable one from the other; namely, the scarf-skin which is external, the thicker or true skin beneath it, and a coagulated substance which lies between both. On future investigation it was discovered that this coagulated substance is exclusively the seat of color in the skin, and is what causes the various shades of complexion in the different inhabitants of the globe. This discovery has been since fully confirmed. If the scarf-skin be separated from the coagulated substance beneath, it will be found to be semi-transparent. This is invariably the case with the scarf-skin of the blackest negro, and with that of the purest white Whence it follows that the outer skin of both being similar in transparency and color, (and the inner or thicker skin being known not to differ in persons of the most opposite complexions,) the intermediate coagulated substance must be the seat of color; and this substance varying in its tint, and appearing through the transparent scarf-skin, produces the different complexions of the human race

Whatever causes co-operate in creating these appearances, produce them by acting upon the coagulated substance; which, from the almost incredible manner in which the scarf-skin is perforated, is as accessible as this skin itself. These causes are probably those various qualities of things, which, combined with the influence of the sun, contribute to form what we call climate. For the coagulated substance is found to vary in its color from the equator to the poles

SPEECH.

We shall now proceed to examine briefly, the organs of speech which give to man a superior and distinctive faculty.

The organs of speech are the mouth, the windpipe, and the lungs. The first of these is known to every one, as also the parts which it contains. The windpipe is a passage commencing at the back part of the mouth, and thence descends along the neck to open into the lungs. At its upper part it is constructed of five thin cartilages, connected together by ligaments, and put into motion by small muscles. These cartilages form a chamber at the head of the tube, which is situated at the root of the tongue, and may be felt to project in the upper and fore-part of the throat. The opening of this chamber into the throat is a very narrow chink, which is dilated and contracted to produce every change in the modulation of the voice, by the muscles attached to the cartilages. To defend this opening, a beautiful contrivance is adopted of an elastic valve, which falls flat upon it whenever we swallow, like the key of a wind instrument; and which at other times rises up and leaves the aperture uncovered for the uninterrupted ingress and egress of the air.

The tube leading to the lungs is formed by numerous semicircular cartilages, connected by muscular fibres and membranes. They are elastic and firm, to keep the canal of the windpipe always open, and to resist compression. At the same time it is nearly as flexible as though it was wholly membranous, and gives way to all the bendings of the neck. Had it not been so, we should have been in perpetual hazard of strangulation. The passage to the stomach, on the contrary, being intended only for occasional use, has its sides always collapsed, unless when distended by the passing food. The lungs are two cellular bags for containing air; they are situated in the chest, and both open into the bottom of the windpipe.

In *inspiration* the air dilates the lungs. These, like bellows, force it back in *expiration* into the windpipe. Here the air is straightened in its passage, and made to rush with force along the tube towards its upper end, where striking against the elastic cartilages of this part, it is variously modulated, and the sound of the voice produced. But these cartilages do not articulate the sounds: to effect this the voice is required to pass through the mouth, where it is differently modified by the action of the tongue, which is either pushed against the teeth, or upwards towards the palate, detaining it in its passage, or permitting it to flow freely, by contracting or dilating the mouth. It has been humorously and truly remarked of the tongue, that it is the only muscle under the control of the will which is not wearied by incessant use.

LARYNX.

The following description of the larynx I take from my translation of Tobold's Chronic Diseases of the Larynx:—

"The larynx belongs to the musical instruments which are designated as tongue-piped. There are wind instruments with hard and with soft tongues. To the former belongs the well-known mouth-drum, to the latter, the larynx, with its double-lipped membranous tongues extended within its cavity, with its bellows (lungs), its air-tube (bronchial ramifications, trachea), and its mouth-piece (pharynx, mouth, and cavity of the nose). If the vocal chords are put in vibration by a continuous expiratory stream of air from beneath, while the glottis is contracted, a sound is made, the height and depth of which depends on the length, the elasticity, and the extent of the tension.

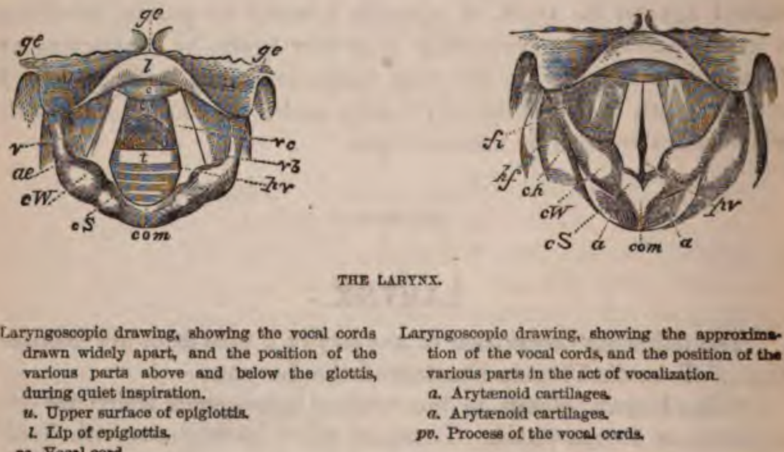
"The formation of the voice depends on four main points.

"1. The air must be moved against the chink of the glottis with a certain expulsive power.

"2. The chink of the glottis must not exceed a certain diameter. If the opening of the glottis extends more than one-twelfth or one-tenth of an inch, no more sound will arise. But the opening is made chiefly by the glottis ligamentosa, while the glottis cartilaginea must remain closed to give rise to a pure sound.

"3. The vocal chords must every time have a defined tension, for if they be very much extended, a shrieking, piping sound is made, whereas, if they be much slackened, only a dull sound is produced, if at the same time the glottis be much shortened.

"4. The excursive capability of the vocal chords must not be interfered with, and their elastic power must be fully intact, as they are extended by the pressing forward column of air, and are thus dilated and elevated. The degree of tension depends on the power of the stream of air and the elasticity of the vocal chords."



THE LARYNX.

Laryngoscopic drawing, showing the vocal cords drawn widely apart, and the position of the various parts above and below the glottis, during quiet inspiration.
u. Upper surface of epiglottis.
l. Lip of epiglottis.
vc. Vocal cord.

Laryngoscopic drawing, showing the approximation of the vocal cords, and the position of the various parts in the act of vocalization.
a. Arytænoid cartilages.
a. Arytænoid cartilages.
pv. Process of the vocal cords.

(See articles on *Larynx* and *Laryngoscope*.)

THE BLOOD.

Having now described those parts of the human body on which its figure, support, strength, motion, sensibility, &c., immediately depend, we next come to those which are intended to replace the waste of the machine, and to supply it with new energies.

Like all other animal matter, the human body suffers a constant change. Life itself is an action inducing change, which ultimately leads to death. This change is continually taking place, a removal of the old, worn-out particles, and an incessant deposition of new ones. To effect the latter purpose, nutritious matter must be lodged in the animal machine, otherwise it will speedily wear down and run into dissolution. We therefore find it supplied with a rich store of a nutritious fluid, fine enough to penetrate its minutest parts, and constantly circulating through the whole machine.

The following description of the blood, from the excellent treatise of Professor Dalton, I present in full in his own language:—

"The *blood* is a thick opaque fluid, of a rich deep red hue, so peculiar that it may usually be distinguished by its color alone. It contains many different ingredients, of which the most important are, first, *water;* second, *mineral substances;* and, third, *albuminous matters.*

"The water of the blood is what gives it its fluidity. For if the water be driven off by evaporation, the other ingredients remain behind in the form of a dry mass, which would be entirely useless for the purpose of nutrition. But in its natural condition the water of the blood unites all its other ingredients into a uniform liquid, which easily moves through the blood-vessels, and dissolves the new substances which are absorbed from without. Taken altogether, the water forms rather more than three-fourths of the whole mass of the blood.

"The mineral ingredients are in much smaller proportion. The most abundant is common *salt,* which we know is taken with the food, and is a necessary ingredient of all the tissues. It forms, however, only about four parts in a thousand of the whole blood. The combinations of *lime,* which the bones and teeth require for their nourishment, are found in still smaller quantity, dissolved in the animal fluids of the blood. Other mineral substances of various kinds are also present in their requisite quantity.

"But the most remarkable of all the ingredients of the blood are its albuminous matters. It is these substances which give to it its thick and animal consistency, and which also act the most important part in the nutrition of the body. They are of two different kinds, which are naturally mingled together in the blood in a liquid form.

"The first of these is the *albumen*. We can obtain a tolerably correct idea of the characters of albumen from the fresh white of egg, which has received a similar name. This is not exactly the same thing with the albumen of the blood, but still the two resemble each other very closely. They may both be coagulated by boiling, when they become solid, white, and opaque. The principal difference between them is, that the fresh white of egg is partly gelatinous in consistency, while the albumen of the blood is perfectly fluid, and may readily be made to flow through the veins, or to run from one glass vessel into another.

"The albumen is about forty parts in a thousand, or one twenty-fifth of the whole blood. It represents, in great part, the concentrated nourishment derived from the food, for it is probably into this substance that most of the albuminose is converted, after being absorbed from the intestine in the digestive process. It is the material out of which the tissues of the body are afterward formed.

"The other animal matter in the blood is the *fibrine*. Although this is in very small quantity—viz., only two parts in a thousand—it is an exceedingly curious and important ingredient. For it possesses a property which does not belong to any other animal substance, viz., the property of 'spontaneous coagulation.'—that is, it will coagulate by itself, without being boiled or brought in contact with an acid, or treated by any other chemical substance. We shall see hereafter what an important character this property gives to the blood.

"But these substances are only the liquid portions of the blood. They are all dissolved in each other, and form a perfectly transparent and almost colorless fluid. Beside them there are a multitude of little rounded bodies contained in the liquid mixture, which make the blood opaque, and give to it its red color. They are so abundant that they are crowded together by thousands in each drop of blood, and so minute that they are only visible by the aid of the microscope. They are called the *blood-globules.*

"*Globules of the Blood.*—If we examine a drop of blood under the microscope, we see the blood-globules floating in profusion in the fluid parts. Each one is a delicate circular plate or disk, somewhat like a piece of money in form, only with the edges rounded, and rather thicker than the central part. In human blood they are about $\frac{1}{3000}$ of an inch in diameter, when measured across their flat surfaces, and about $\frac{1}{8000}$ of an inch in thickness.

"The blood-globules are exceedingly soft and flexible in consistency. In fact, they are nearly fluid, like drops of very thick oil or honey, only they do not dissolve in the other parts of the blood, but retain their own form and substance. Consequently, when moving about in the fluid, as they often do under the microscope, following accidental currents in the blood, passing through narrow channels, and turning corners among the other globules, they may be seen to twist about, and bend over, and elongate in various ways, and then resume their natural figure as before. This peculiar semi-fluid and flexible consistency is one of their greatest peculiarities.

"When seen by transmitted light and in thin layers, they are of a very pale amber color, and nearly transparent. Nevertheless they contain all the red color of the blood; and when seen heaped together in layers only five or six deep, they show distinctly the ruddy color which belongs to them. Beside, if they are separated by filtration or any other means, or if they are not formed in their natural quantity, the blood becomes paler, exactly in proportion as its globules are deficient.

"They also communicate to the blood its opacity. Although each globule by itself is transparent, yet, when they are crowded together and mingled with the fluid parts of the blood, the whole becomes opaque, and apparently impenetrable to light. This is because the globules of the blood and its fluid parts are of a different nature and composition. The same thing will happen when oil is emulsioned by a watery alkaline solution. The oil is transparent by itself, and the alkaline liquid is transparent by itself; but if you mix the two together, the whole becomes white and opaque like milk. So the globules of the blood and its fluid parts, mingled together, produce a thick red and opaque liquid.

"The red globules are the vivifying elements of the blood. They communicate to it its animating and stimulating properties, by which all the organs are maintained in a condition of vital activity.

"Beside the red globules, the blood contains other little bodies of a different form and aspect. These are the *white globules*. They are very much less numerous than the red, as there are not more than three or four of them for every thousand of the others. They are of a little larger size, measuring about $\frac{1}{2500}$ of an inch in diameter, of a rounded form and a finely granulated texture. They are usually concealed, for the most part, in the greater abundance of the red globules.

"When the ingredients of the blood are examined by analysis, they are found to be mingled together in the following proportions:

"COMPOSITION OF THE BLOOD IN 1000 PARTS.

"Water	795
Globules	150
Albumen	40
Fibrine	2
Other animal matters	5
Mineral substances	8
	1000

"*Coagulation of the Blood.*—Such are the properties and constitution of the blood while circulating in the interior of the body. But if it be withdrawn from the vessels a very remarkable change takes place, which alters its whole appearance.

"This change is its *coagulation.*

"When a patient is bled from the arm or is accidentally wounded, the blood runs from the opened vein in a perfectly liquid stream; but soon afterward it begins to appear thicker than before, and will not run in drops, nor moisten the fingers so easily when touched. When this alteration has once commenced, it goes on rapidly increasing, the blood growing thicker and thicker, until it finally sets into a uniform, firm, elastic, jelly-like mass. It is then said to be 'coagulated' or 'clotted.' This change is usually complete in about twenty minutes after the blood has been withdrawn from the veins.

"Now this coagulation of the blood is entirely dependent upon its fibrine. This substance alone has the property of coagulating spontaneously. None of the other ingredients can solidify in this way, and if the fibrine be taken out, the blood loses altogether its power of coagulation.

"But how is it that the whole blood becomes clotted in a single mass, if this power belongs only to the fibrine?

"It is because the fibrine, though in very small quantity, as compared with the other substances in the blood, is diffused uniformly throughout the whole; and when it coagulates, therefore, on being withdrawn from the vessels, it entangles all the other ingredients with it, and holds them imprisoned in its own substance. The water of the blood, accordingly, the albumen, the globules, etc., are all mechanically retained by the coagulating fibrine.

"But not long afterward a partial separation takes place between them. The fibrine solidifies still more; and, by contracting upon itself, squeezes out the liquid portions of the blood from between its meshes. Drops of a clear, amber-colored fluid begin to exude from its surface, and these drops, growing larger and larger, run together into little pools, which still increase in size until the entire surface is covered with the transparent liquid. The remainder grows at the same time smaller and firmer, until at last the whole is permanently separated into two parts, a solid and a liquid. The solid part is called the *clot;* the liquid part is the *serum.*

"If you examine, therefore, a cupful of blood, at the end of twelve hours after it has been drawn from the veins, you will see that it is no longer a uniform mass, but appears as a solid clot floating in the transparent serum.

"The clot, at this time, is still firm, red, and opaque, since it contains all the globules of the blood as well as the fibrine. For these globules cannot escape from the clot, owing to their form and size, and are therefore retained by the meshes of the coagulated fibrine. The serum, on the other hand, is transparent, and nearly colorless. It contains all the albumen, the water, and other substances dissolved in them.

"*Importance of Coagulation.*—Now this coagulation of the blood is a property of the greatest importance; for it is the only thing which prevents our bleeding to death after the slightest incision or injury to the blood-vessels. Whenever these vessels are opened by an accidental cut in the skin or in the muscles, the blood at first flows with great freedom, according to the size of the wound. But if we press firmly upon the injured part with a bandage or with the fingers, and then, after a short time, remove the pressure, we find that the bleeding has stopped altogether. This is because the thin layer of blood between the edges of the wounded vessels has coagulated and blocked up the opening. No matter how thin this layer may be, it still coagulates; for every particle of the blood, however small, contains its due proportion of fibrine, and, consequently, solidifies at the proper time. The clot thus formed adheres to the edges of the wounded parts, and so acts as a continuous bandage or plug, until the tissues have again grown together and become permanently united.

"It is in this way that the bleeding from all ordinary wounds is usually arrested by nature. No matter how freely the blood may flow at first, if you keep the parts steadily compressed for twenty minutes or half an hour, the fibrine will then be coagulated and the bleeding will stop.

"But when the wound is very deep, or when any of the principal arteries have been severed, this means will not succeed; for the blood comes with so much force from those larger vessels that it cannot be kept back by ordinary pressure, and no time is allowed for its permanent coagulation. Then we must call for the assistance of the surgeon, who is often compelled to search for the blood vessels in the deeper parts of the wound, and to tie up their open mouths with a fine cord or ligature. Why this operation is successful requires a further explanation.

"*Coagulation in the Interior of the Body.*—It is a curious fact that the blood will coagulate, not only when it is discharged externally, but also even in the interior of the body, *whenever it is withdrawn from the ordinary course of the circulation.* Thus, if we receive a bruise, and the little vessels beneath the skin are torn, the blood which flows from them coagulates in the neighborhood of the injury. Any internal bleeding produces, after a time, a clot in the corresponding situation where the blood is effused. After death, also, coagulation takes place in the cavities of the heart, and in the great veins near it; and whenever any part of the body is so injured as to stop its circulation, the blood necessarily coagulates in its vessels.

"Accordingly, when the surgeon places a ligature upon a wounded vessel, he stops the circulation through it. The blood is imprisoned in the neighborhood of the ligature, and soon afterward coagulates and blocks up the cavity of the vessel with its solidified fibrine. After a time the ligature separates and is thrown off, and the wounded parts unite by the healing of the tissues.

"We see, therefore, that the coagulation of the blood is a property that belongs to the fibrine, and that it is spontaneous. As soon as the fibrine is formed it possesses this property, by which it is distinguished from all other substances. It is not manifested immediately, for it requires a certain time for its completion; but, owing to the very nature of the fibrine, wherever it may be, within a short period after it is shut off from the circulation it exhibits this peculiar character, and coagulates inevitably.

"Why, then, does it not coagulate in the vessels, and thus stop the circulation of the blood?

"To understand this, we must remember that the history of all the animal substances in the living body is one of incessant change. None of them remain the same, but all undergo successive transformations. The albuminose formed in digestion is no sooner taken up by the blood-vessels than it is converted into albumen. The oily matters absorbed with the chyle, and the sugar produced in the liver, are also rapidly decomposed, as we have seen, and disappear in the circulation. What is destroyed in this way for the purposes of nutrition is constantly replaced by a fresh quantity formed in the same organs.

"This is also true of the fibrine. That which is circulating in the blood-vessels to-day is not the same fibrine which was there yesterday, but a new supply, freshly produced in the process of daily nutrition. It is estimated by physiologists that all the fibrine which exists in the blood is destroyed and reproduced at least three times over in the course of a single day. What the new substances are which are formed by its decomposition is still unknown, for we cannot yet follow out all the details of these changes which take place so rapidly in the living body. But there is every reason to believe that the renovation of the fibrine in the blood takes place as constantly and rapidly as that of its other ingredients.

"The blood, therefore, does not coagulate while the circulation is going on, because its fibrine is being incessantly altered and converted into new substances. It has been found that in certain of the internal organs, especially in the liver and kidneys, the fibrine disappears, and that little or none of it is contained in the blood returning from them. When we come to learn with what rapidity the circulation is carried on, we shall easily understand how coagulation may thus be prevented. But if the blood be withdrawn from the circulation altogether, or confined in any part by a ligature, then its fibrine can no longer go through with the natural changes of its decomposition, and it accordingly coagulates, as we have above described.

"*Quantity of the Blood.*—The entire quantity of blood in the vessels is about one-eighth part, by weight, of the whole body; so that in a man weighing 140 pounds, the quantity of blood is very nearly 18 pounds. The quantity of blood, however, as well as its composition, varies somewhat at different times. Soon after digestion it is considerably increased; for it has absorbed all the nutritious materials taken with the food, and these materials must necessarily pass through the blood in order to reach the tissues. After long abstinence it is diminished in quantity to a corresponding degree. For the same reason, its composition varies to a certain extent, since its different ingredients will diminish or increase, according as they have been discharged or absorbed in greater or less abundance.

"*Effects produced by Loss of Blood.*—Only a small proportion of the blood in the body can be lost without causing a serious effect upon the system. Generally speaking, the loss of one pound of blood causes faintness, and that of a pound and a half or two pounds is followed by complete unconsciousness. If the bleeding be then stopped, the patient usually recovers; but if a still larger quantity of blood be lost, recovery becomes impossible.

"When the strength, however, has been very much reduced by excessive bleeding, it may sometimes be restored by injecting into the blood-vessels healthy blood from another person. This is called the 'Transfusion of the Blood.' In several instances, where the vital powers were nearly exhausted, life has been restored by this operation.

"*Two different kinds of Blood in the Body.*—Finally, there is a most remarkable difference in the appearance of the blood in different parts of the body. In one half of the circulation, that is, in all those vessels which are called 'arteries,' it is of a brilliant scarlet hue; while in the 'veins' it is of a deep bluish-purple, almost black color. These two kinds of blood follow each other in the circulation, changing alternately from one color to the other; so that, although there is always red blood in the arteries, and always blue blood in the veins, yet the same blood is alternately scarlet and purple, as it passes from one set of vessels to another."

THE ORGANS OF CIRCULATION.

THE HEART.

This organ is situated nearly in the centre of the human body, occupying a place in the chest rather to the left of the centre of this cavity, and lying immediately upon the diaphragm or muscle dividing the chest from the cavity below, with its apex or point inclining towards the bony extremity of the sixth rib of the left side, and against which it may sometimes be felt to strike. In this situation the heart is sustained by the large blood-vessels which originate from its base; but its point is entirely free, and it is surrounded by a strong membranous bag or purse, which is firmly fastened to these vessels, and to the diaphragm. It serves to preserve the moisture of its surface, by constantly exuding a fine thin lubricating fluid, and thus lessens its friction with the parts in contact with it; at the same time that it supports the heart itself when under violent action.

The heart consists of four cavities or chambers for receiving the blood, and for giving it a fresh impulse. Two of these cavities are on each side, and communicate with each other by an opening through the partition which divides them; but they are totally distinct from the cavities on the other side, although they correspond with them in shape, structure, and use. The heart may be said, therefore, to consist of two distinct organs; the one on the right for sustaining the circulation through the lungs, and the other on the left for impelling it through the rest of the body. The first cavity on the right side of the heart is called its auricle, and receives the terminations of two large veins which reconvey the blood returning from all parts of the body to the heart. This cavity may be viewed as a reservoir for the returning blood, which it discharges into the other cavity of the same side, called the right ventricle. The opening into the ventricle is closed by a valve, which is so contrived as to admit the blood, but to prevent its return. The ventricle has another opening leading from it into an artery, and the right ventricle, when filled with blood from the auricle, contracts and forces it into the artery of the lungs; and (that it may be able to propel the blood with sufficient force into this tube) it is constructed of greater strength than the auricle, having its walls firmly supported by fleshy columns, which extend across the cavity of the ventricle, and connect its opposite sides together. There are valves also situated at the commencement of the artery of the lungs, and for the same use as in the auricle, viz., to prevent the blood from returning into the cavity, whence it had just been expelled.

This description of the right side of the heart will suffice for that of the left; both being constructed nearly in the same manner, having corresponding cavities or chambers, and for similar purposes. But it ought to be observed, that as the right auricle receives the blood returned to the heart from all the parts of the body; and the ventricle of the same side propels it into the vessels of the lungs; so the auricle on the left side of the heart receives this blood from the lungs, by four veins which open into it, while it is the office of the left ventricle to force it into a new circulation along the extent of the whole body. The left ventricle is stronger than the right, because it has a greater resistance to overcome.

The substance of the heart is muscular, being composed of red and elastic fibres, similar to those which constitute the other muscles of the body; but so arranged as to admit of contraction in all directions, and with such a peculiar modification of the excitable principle as to be contracted and dilated alternately through the whole of life; so that the circulation never ceases. The heart, in fact, possesses the contractile power in a higher degree than any other muscle. It is called into action partly by the mechanical distension of the blood, although principally, no doubt, by its peculiar qualities as a stimulus. The auricles of each side are filled at the same instant, while the ventricles are at the same time emptying themselves. The right auricle, when filled, contracts, and urges the blood onward into the now relaxed ventricle; the last, when distended, contracts in its turn; the flaps of the valves are thrown back, and close the opening into the auricle, and the blood has no other outlet but into the pulmonary artery, which leads to the lungs; where it is to be changed in its color and other properties. The artery is now dilated, its valves are instantly closed, and prevent the return of the blood into the ventricle. Then the artery contracts, and impels its contents onward, to make way for a new wave of blood. During this time corresponding motions take place in the left side of the heart, with this difference only, that the left ventricle forces the blood into the aorta, or great artery of the body, after it has undergone its due changes in the lungs, through which it was circulated by the force of the right ventricle.

It is observable, that this motion of the heart not only survives that of the organs of voluntary motion, but continues a considerable time even after it is separated from the body. Nay, after it has ceased to palpitate, yet its contraction and dilatation may, by the application of stimuli, be alternately renewed and continued some time longer. Hence in drowning and suffocation, though the pulse be imperceptible, and life apparently extinguished, the heart still preserves this latent power, or susceptibility of motion; for though unable to propel the blood through the vessels of the body, it needs only to be excited by suitable stimuli to renew its action. In the first rudiments of life, even before the brain is formed, a pulsating point or spot shews the embryo heart in miniature, and marks its primeval irritability, as a sure pledge of vitality. The heart of the chick begins to move before we can presume that there is any organ for distributing the nervous power. The palpitating point is the heart of the chick, and it is seen beating while its body is but a rude, unformed, and gelatinous mass.

As this singular organ exhibits irritability the first, so it never relinquishes it till the last, and may therefore be considered as the first part of the animal which lives, and the last which dies.

In animals with cold blood, this irritability is very great, and continues a long while. The heart of a viper will palpitate when taken from the body, twenty-four hours; and that of a turtle, thirty, or longer. In the warm blooded animals, it moves till the fat is rendered stiff by the cold, when the motions of the heart and all the other muscles commonly cease.

THE ARTERIES.

From the ventricles of the heart arise two large elastic tubes, called arteries, which afterwards divide like the trunk of a tree, into innumerable branches. The one commencing at the right side of the heart, conveys the blood to the lungs, while that which is continued from the left ventricle, carries it to all the other parts of the body. The arteries are composed of three membranes called coats, an external coat, a middle coat, which is muscular, and an inner one, which is smooth. They partake of the nature and action of the heart, for being dilated and irritated by the blood impelled into them from the heart, they contract, by means of their muscular coat, upon this blood, and thus propel it to all parts of the body, for their nutrition, and the various secretions. This dilatation and contraction is called the pulse, and is perceptible in the trunks and branches of the arteries, but not in their minute ramifications, except when inflammation is going on.

THE VEINS.

The blood, having been conveyed by the arteries, even to the extreme parts of the body, for its nourishment and repair, the surplus is carefully returned to the heart and lungs, to be prepared for a new circulation; and for this purpose are the veins provided. They commence from, or rather are continuous with the minute arteries, and as they approach the heart, they run into larger but fewer tubes, till at last they terminate in it by six great trunks. Two of them empty their contents into the right auricle; the one collecting the blood from the vessels of the head and the upper extremities, while the other ascends with it from the lower parts of the frame. These are loaded with venous blood; but the remaining four veins pour the blood from the lungs into the left auricle; it is now changed into a bright red color, and is called arterial blood, because it has the appearance with which it is always found in arteries; so that in the lungs the office of the arteries and veins is transposed; the former conveying venous blood, while the latter are filled with arterial blood.

The continuation of the extreme branches of the arteries to those of the veins, resembles two trees united to each other at their tops, while their trunks are so disposed as to terminate in a common point, the heart; and if we suppose that both these trunks and their ramifications are hollow, and that a fluid is incessantly circulating through them, by entering into one of these trunks, and returning through the other, we can conceive how the blood is circulated through the human body.

The veins do not pulsate, like the arteries. The blood which they receive from those vessels flows through them very slowly, and is conveyed back to the heart by the current of blood from the arteries, and the contraction of the muscles, among which they ramify. It is prevented from flowing backwards in the veins by valves, which constitute one of the great distinctions between these vessels and the arteries. The valves are formed by the innermost membrane of the vein rising up in a fold into the cavity of the vessel, like a curtain, and stretching itself along the vein so as to form a kind of crescent which permits the blood to flow on towards the heart, but immediately stops it if attempting to flow back.

The absorbents are thin and pellucid vessels arising from the various surfaces of the body, and running to a common trunk or tube, called the thoracic duct, because it lies principally in the thorax or chest, which empties itself into a vein a little before it comes to the heart. They are distinguished into two kinds, the lacteals and the lymphatics; the former absorb the nutriment from the intestines, and convey it by the thoracic duct into the circulation, while the latter vessels take up the colorless fluid, called lymph, (whence they receive their name) and convey it from all the parts of the body to the same point. Thus the parts of the blood which either from their thin, oily, or nutritive qualities, had been separated from the red, circulating mass, and thrown out by the secreting or exhaling arteries, are absorbed, after having performed their various uses, and are again conducted by the lymphatic vessels back into the circulation to mix with the blood; and the lacteals, or absorbing vessels of the intestines, drink up the milky fluid formed from our food, and carry it to the heart and lungs to be changed into blood.

Hence we see that absorption is a function necessary to the circulation, and highly essential to life. It completes the circle in which our fluids move, and supplies the constantly decreasing blood with new parts. But there are other purposes, which this curious and beautiful operation of our frame accomplishes. The skin is full of small pores which are the mouths of lymphatic vessels. Through these are absorbed properties from the surrounding bodies, as from the air, water, or such substances as may be in contact with the skin, and are thence conveyed into the system for its refreshment, or cure; for instance, medicines rubbed on the skin enter the body, and affect the frame.

But a grand, constant, and universal agency of our lymphatic system, is the removal of old, useless, and worn out parts, and the making room for new ones. This astonishing power of our frame to change its withered, for sound, healthy particles, is not confined to any one part or organ of the body, but is possessed by all. Delicate membranes, and strong tendons, the soft moving muscle, and the hard, solid, inactive bone, are all acted upon by these modellers of our frame, throw off the old exhausted particles of which they were composed, and acquire fresh ones. By this constant and general renovation of all its parts, which endures through life, are the health and vigor of the whole body preserved.

Absorption also helps to remove those injuries which happen to the frame by accidents. If a tumor arises from a blow, the absorbents will soon begin to act, and eventually remove the swelling. A fluid poured from its ruptured vessel will be absorbed by the lymphatics, and carried again into the circulation. Even parts of the body which are diseased, or have their organization destroyed, and are consequently unable to perform their functions, will have their dead particles carried off by absorption, and room made for fresh, healthy depositions. The black or greenish spot which is left by a bruise, is owing to blood having exuded from a ruptured blood-vessel. Its disappearance is the effect of the action of the absorbents, which is at all times, and in a similar degree, operating in every part of our body, but not equally obviously. According to the proportion which the action of the absorbing vessels bears to that of the arteries, by which fresh supplies of nourishment are brought to all parts, will the size of the body depend. Hence in youth the absorbents depositing more nutritious matter than the arteries convey away, the frame grows and expands. In middle age there being a balance between the actions of the two systems of vessels, no change can take place; but the absorption being greater in old age than the nutritious action of the arteries, the body shrinks from its usual dimensions, the limbs become wasted and shriveled, and the whole frame totters towards the grave.

The absorbents are full of valves like the veins, for preventing the flowing back of the lymph; and the power by which they drink up this fluid, and with it the decayed and dissolved solids of the body, is supposed to depend principally on their muscular structure; the mouths of these vessels being filled with the particles of the fluid, their coats contract, and their contents being pressed upon at the sides, and prevented from returning by the valves, are necessarily propelled towards the termination of the absorbents in the veins, there to be mixed with the blood.

THE GLANDS.

These organs are designed to separate various substances from the blood, and are situated in different parts of the body. They differ in size, shape, and construction, according to the peculiar kind and quantity of fluid which is meant to be separated from the mass of blood. Thus while some are of a small and roundish figure, others are much larger and variously formed. Each of the small glands consists, first of an artery for supplying the gland with blood, and also for separating, by the peculiar disposition of its extremity, a particular kind of fluid from this blood; next of an excretory duct or canal which goes out of the gland, and conveys thence the secreted fluid, by the contractility of its coats; and lastly, of a vein for returning to the circulation, the blood remaining after the secretion has been accomplished.

Of this simple kind are most of those little glands, which are found in different parts of the body, as under the skin, in the mouth, nose, eye, &c. and which, by secreting an oily or mucilaginous fluid from the blood, keep the parts on which they lie constantly moist, prevent friction, defend them from the air, and from the floating particles which it may contain. That the vessels necessary to effect secretion may not be extended into long and inconvenient lines, they are skilfully coiled into a small space, and connected together by cellular substance, and assume the roundish and even appearance, which those little glands exhibit.

The large glands consist principally of an aggregation of the small ones, but have the following peculiarities of general structure; 1st, all the arterial branches which bring the blood to the gland, and afterwards become the organs of secretion, arise from one great trunk, which does not divide till it has reached the body of the gland; 2nd, the excretory ducts of the various small glands, composing the great one, all run to unite into one large, common tube or canal for conveying away the collected secretions of the little glands; and 3rd, the branches of the veins, corresponding with those of the artery, all pour their blood into one great trunk, by which it is returned into the circulation.

This process of separating various bodies from the mass of blood is termed secretion, and it is a most important function; for every animal production is a secretion, whether there be a complicated apparatus for forming it or not. Thus bone, flesh, fat, skin, &c. are as strictly secretitious as the urine, the bile, or the tears; only that in the latter case, for the sake of compactness, or because the secretion was wanted in one spot for a specific purpose, the apparatus for producing it is limited; while in the other instances, the substances are formed in many parts of the body.

The term gland has been confined to the congeries of vessels, &c. above described; but as we have seen parts the least peculiar in their structure perform the functions of a gland.

In general the substances they secrete are of immediate use in the animal system, and are so either constantly or occasionally. In the latter case, a reservoir is attached to the gland in which the secretion is accumulated till it is wanted.

There are other secretions which separate useless or noxious bodies from the blood: these are termed excretions; such are the urine, the perspirable matter, and some others. They are the vehicles by which worn out particles are removed, as well as noxious ones.

The manner in which the glands effect secretion is wholly unknown. They are composed of similar vessels, have a common fluid to secrete from, and still they separate substances wholly differing from each other and from the blood.

Their mechanism is too minute for our inspection; and it never will be in our power to examine the machine when at work; all our observations must, therefore, be confined to the dead body. Hence we have little hope of penetrating this mysterious process, although we may conceive in general, that vessels of different sizes, lengths, convolutions, and angles of separation from their trunks, will be fitted to deposite different compounds. In truth the body is a complicated laboratory, where chemical and other changes are incessantly taking place.

REVIEW OF THE CIRCULATION.

The celebrated Harvey was the discoverer of the circulation of the blood. "Seeing," says he, "that the blood passed from the arteries in abundance into the veins, unless these were to empty themselves, and the others to be refilled, that ruptures of vessels every where would take place, which does not happen, I began to conjecture there must be a circular motion of the blood; but this doctrine was so new and unheard of, that I feared much detriment might arise from the envy of some, and that a number would take part against me, so much does custom and doctrine once received, and deeply rooted, pervert the judgment. However, my resolution was bent to set this doctrine forth, trusting in the candor of those who love and search after truth."

No sooner had he published his discovery of the blood's circulation, than prejudice assailed him. Few physicians, and none passed the age of forty, believed his doctrine, which they stigmatised as an heretical innovation in philosophy and physic. Even his practice began to decline. But he had the happiness to outlive the clamors of ignorance, envy, and prejudice. Professional men were at last ashamed to own that they had ever disbelieved his doctrine, which was essentially the same as that which we have previously described.

The circulation of the blood can be easily seen, by the help of a microscope, in the bodies of different creatures, which are either wholly, or in part transparent; and the observations made by this means are preferable to any others we can make, since, in dissections, the animal is in a state of pain, or dying; whereas in animals viewed in the other mode, all is left in its usual course, and we see what nature does in her own undisturbed method. The tail of the newt, or water-lizard, affords a very entertaining prospect of the circulation of the blood, through almost numberless small vessels. But no object shows it so well as one of those animals while so young as not to be above an inch long; for then the whole body is so very transparent, that the circulation may be seen in every part of it, as well as in the tail; and in these subjects nothing is more beautiful than the course of the blood to and from the toes, where it may be traced all the way with great ease. Near the head there are also found three small fins, which afford a very clear view of the circulating blood. These are all divided like the leaves of the common fern, and, in every one of their branches, the blood may be very accurately traced, running to the end through the artery, and then returning back again by a vein of the same size. As the vessels are very numerous and large in this part, when the third or fourth magnifier is used, there are sometimes seen thirty or forty channels at once. The large size of the globules of blood in the newt, and their fewness in proportion to the quantity of serum, renders them particularly distinct; and we remark that their figure, as they are protruded through the vessels, changes in a very surprising manner.

The impetus, occasioning the circulation, is great enough in some animals to raise the blood six, seven, or eight feet high from the orifice of a divided artery; and that the force of the heart must be very great, appears also from its expelling about eight pounds and twelve ounces every minute, with a velocity equal to one hundred and fifty-nine feet in that time, besides overcoming a great resistance in distending the arteries. The space of time wherein the whole mass may ordinarily circulate, is not ascertained. Some of the latest writers however, state it thus. Supposing the heart to make two thousand pulses in an hour, and that at every pulse there is expelled an ounce of blood, as the whole mass is not ordinarily computed to exceed twenty-four pounds, it must be circulated seven or eight times in the space of an hour.

Such is the circulation of the blood, and the astonishing arrangement and powers of its organs. Whether we consider the force which they exert, their never wearying action, or the admirable wisdom with which they are disposed, the subject forcibly impresses the mind. Here we find one of the most noticeable and peculiar animal functions. Far less magnificent in their plans, and less skillful in their execution, hydraulics offer us but faint analogies with it, in those machines, by means of which water is distributed into every quarter of a great city. Upon the whole contrivance of the circulation we may truly say that the Creator has impressed distinctly his own signet.

ORGANS OF RESPIRATION.

We will now consider one of the most beautiful and important functions of the animal body; upon which life itself immediately depends, and which is constantly replenishing all its springs. Breathing, like the circulation of the blood, is essential to the preservation of the animal. The one supplies it with fresh nutriment, and thus prevents decay. The other animates the whole of the machine, and invigorates all its movements. To comprehend this function, it will be necessary to extend our views to the nature and properties of the air engaged in respiration, and to those influences which it has upon the animal body. We here describe the organs of respiration, and the manner in which it is performed in man, and in other creatures.

THE TRACHEA OR AIR-TUBE.

The trachea, or windpipe, by which the air is conveyed from the mouth and nostrils into the lungs, has nearly the same construction in quadrupeds as in man. It is formed of cartilaginous rings, and an elastic ligamentous membrane. The rings are intended to keep the area of the tube constantly open, but do not describe a circle; the back part of the windpipe, or that side of it which lies next to the canal leading from the mouth into the stomach, being composed almost wholly of the elastic membrane, for the greater convenience in the act of swallowing. This membrane also connects the cartilaginous rings together, and completes the sides of the tube. The upper part of the trachea, as we have before observed, is peculiarly formed for producing the voice, and has a small thin cartilage placed over the mouth of the tube, which occasionally shuts down, and closes the passage to the lungs, as in swallowing. From this part the air-pipe descends along the fore-part of the throat, till it passes into the cavity of the chest, to enter the lungs. Its internal surface is constantly kept moist, and defended from the air when passing, by a mucus which is poured out from small glands every where strewed on the membrane lining this tube. A similar mucus lines all the passages which lead to the internal cavities from without.

When the air-pipe has nearly reached the lungs, it divides into two great branches. One of these goes to each lung, and is distributed through the whole of its substance, in an infinite number of ramifications, all constructed in a manner similar to the original tube, till they become very minute; when instead of having cartilaginous rings, they are found to be wholly membranous. These small branches terminate in innumerable cells, which communicate with each other, and give the lungs the appearance of a honey-comb when its substance is cut into, particularly in some animals where the cells are large; as in the turtle.

EXPLANATION OF FIGURE III.

HEART AND LUNGS.

This Plate shows the Larynx, Windpipe, Heart, and Lungs, and the large vessels by which they are connected.

L. Larynx, or Vocal-box; the organ in which the voice is formed.

T. The Trachea, or Windpipe; connecting the Larynx to the Lungs.

A. The Aorta, or Large Artery of the Heart; arising from the Left Ventricle.

P. Pulmonary Artery, or Artery of the Lungs; this Artery arises from the Right Ventricle of the Heart, and divides into two branches, one going to each Lung.

C. Left Auricle of the Heart.

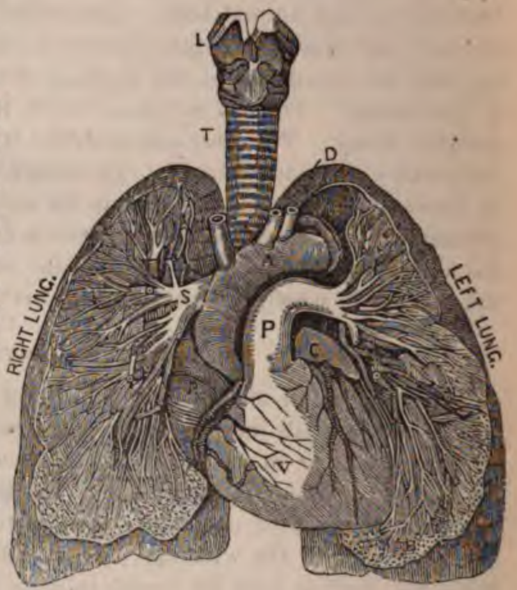
R. Right Auricle.

E. Air Cells of the Lungs.

V. Right Ventricle of the Heart.

D. The cut ends of Arteries going from the Heart.

S. Small branches of the Right Pulmonary Artery; a portion of each Lung having been cut away to show these branches and the Air Cells.



THE LUNGS.

We have already observed that the trunk of the body is divided into two great cavities by the diaphragm, which is a horizontal fleshy partition, and that the superior cavity is called the thorax or chest, and contains the heart and organs of respiration. This cavity is again divided into two lesser ones, by a strong membranous partition, which runs in a direction perpendicular to the diaphragm, and extends from the back-bone to the fore-part of the chest. It is composed of the membranes lining the two cavities, which being applied to each other laterally, like two bags, form a partition for separating and sustaining the lungs, and for preventing them from pressing upon each other, in the different positions of the body. The laminæ composing this partition do not every where adhere together. At the lower part of the chest they recede from each other, to make room for lodging the heart, and at the upper part of the cavity they receive between them a gland called the thymus, the use of which in the animal economy is not yet ascertained. The internal surface of the chest, like all other cavities, is kept constantly moist and smooth for the greater safety of the delicate organs of respiration, by means of this lining membrane, which is called the pleura, and which exudes a fine watery fluid, preventing friction and adhesion of the lungs to the sides of the chest.

The lungs are the principal organs of respiration. They are two in number, one occupying the right, and the other the left cavity of the chest; but they respire by one common tube, the windpipe. Their texture, as may be seen in those of any quadruped, is soft and spongy, being composed of blood-vessels branching out with exquisite minuteness upon the sides of the air-cells. They are united into a mass of cellular membrane, and so disposed, that the blood can extract from the air certain properties which shall be hereafter explained.

RESPIRATION.

Respiration consists of inspiration, or the ingress of the air into the lungs, and expiration, or the egress of the air from the lungs; it commences at birth, and continues through life. In man and quadrupeds it is performed in the following manner.

The diaphragm, dividing the chest from the abdomen, is strong and muscular, and can act with great power in enlarging the cavity of the chest. It is convex towards the lungs, and concave below. When it contracts, its surface becomes nearly flat, and of course the chest is deepened. At the same instant the intercostal muscles contract, and raise the lower ribs which are moveable towards the upper one which is more fixed. When the ribs are raised, they are so contrived as to be drawn outwards, and the cavity of the chest is dilated laterally.

Thus we see that when we inspire the chest is enlarged in all directions. The lungs are suspended in the cavity, and follow all the motions of the parts which enclose them, for when the pressure of the ribs is removed, the air they contain expands by its elasticity, and the external air rushes in to restore the balance. The lungs are now in a state of inspiration, and they are emptied by the following process.

When the diaphragm contracts, it would lessen the abdominal cavity as much as it enlarges that of the chest if its loose enclosure did not give way by protruding.

This protrusion of the belly excites the abdominal muscles to react. Their contraction pushes up the now relaxed diaphragm into the chest, and as they are attached to the lower edges of the ribs, they pull them down with great power, and thus lessen the cavity of the chest. The lungs are compressed, and the air which they had just received is now expelled. This is expiration.

It is pleasing and instructive to observe this admirable alternation of motion by which the mechanism of respiration is effected. The diaphragm and intercostal muscles co-operate in enlarging the chest; they contract and are relaxed in the same instant; while the abdominal muscles seize, as it were, the moment of their relaxation to counteract their motion, and to diminish the size of the chest.

Respiration is performed in the mode above described; in animals which have a muscle, the diaphragm is for this specific purpose. Breathing is essential to all animals, though it is effected variously in different creatures, in correspondence with that indefinite diversity of forms and of habits with which animal existence is endued.

In Prof. Dalton's treatise before quoted, respiration is thus clearly described :—

"*Quantity of Air used in Respiration.*—At every respiration twenty cubic inches of air (⅓ of a pint) are taken into the lungs. If we count the entire number of respirations in a day, including those caused by muscular exertion, this will give about 600,000 cubic inches, or 350 cubic feet of air which passes and repasses through the lungs in every twenty-four hours. This is nearly eighty times the bulk of the whole body.

"*Character of the Respiratory Movements.*—The movements of respiration are *involuntary*. The diaphragm descends and the chest expands without any exertion of the will, and even without our knowledge. From the instant of our birth to the last moment of existence, during the activity of our waking hours and in the unconsciousness of sleep, they continue in untiring and ceaseless operation. For the necessity of respiration is not occasional, but incessant; and the performance of this function, therefore, is not confided to the will, but is provided for by an involuntary action, which requires no attention and produces no fatigue.

"It is true that we can exercise a partial control over the movements of respiration; that is, we can hasten or retard them at will. But this is only for a very short time. If we try to breathe much more rapidly than is natural, say one hundred times a minute, we shall soon find how laborious and exhausting the movements become. On the other hand, if we stop respiration altogether, we at once feel an internal impulse which calls for its renewal, and which grows rapidly stronger and more imperative, until it becomes at last irresistible. There are few persons who can voluntarily suspend the breath for more than thirty or forty seconds at a time.

"Such is the manner in which the movements of respiration are performed. Now let us see what happens while the air is thus taken into the cavity of the chest.

"*Change in the Air during Respiration.*—In the first place, as the air penetrates into the lungs it is robbed of its oxygen. This substance disappears, so that the air which has once been drawn into the chest, and again expelled with the breath, no longer contains it in due proportion.

"What has become of the oxygen which thus disappears from the air in respiration?

"It is absorbed by the blood. For the blood-vessels coming to the lungs are distributed everywhere in the minute spaces between the air-vesicles, and envelop their walls with an abundant vascular network. If we recollect the great extent of surface represented by the tissue of the lungs, we shall see that the blood circulating in their vessels is spread out over a corresponding surface; and that, in a thousand minute currents, it moves through the lungs almost in contact with the air contained in the vesicles. It is as if the blood were sprinkled through the air in a fine shower; so that every particle of the blood and every particle of the air are brought into the closest proximity. At this moment the oxygen leaves the air and enters the blood over the whole internal surface of the pulmonary tissue.

"*Change in the Blood during Respiration.*—At the same time a most remarkable change takes place in the blood itself.

"The blood which is distributed to the lungs is venous blood. It is that which has already circulated through the organs and tissues of the body, and has served for their nutrition. From them it is collected by the veins, brought back to the heart, and from the heart distributed to the lungs. At this time it is of a dark blue or purple color, approaching to black.

"Now, as this venous blood enters the lungs and takes possession of the oxygen contained in the air-vesicles, it changes from a dark blue to a brilliant scarlet color. This change is instantaneous and complete; so that the blood, as it leaves the lungs on one side, is entirely different in appearance from that which is entering them on the other.

"After the blood has passed through the lungs, and has changed its color from blue to red, it returns to the heart, and is again distributed throughout the body by another set of vessels, which are called the "arteries."

"Accordingly, there are always two kinds of blood in the general circulation, of different colors and occupying two different sets of vessels. The blood in the veins is blue, and is called *Venous* blood; that in the arteries is red, and is called *Arterial* blood. The blood is also constantly changed from venous to arterial while passing through the vessels of the lungs.

"It is for this reason that the lips turn purple and the face assumes a dark ashen color whenever the breathing is seriously obstructed. For the blood, no longer becoming arterialized, retains its venous hue, and communicates a dark color to all the transparent and vascular tissues.

"But the change in color is not the only difference between these two kinds of blood. The venous blood, which has already circulated through the body, has lost its vital properties. It has expended a part of its substance in the nourishment of the tissues, and is nc longer fit for the maintenance of life.

"What is it that the blood has thus lost in passing through the tissues which is necessary to its vitality?

"It is its oxygen.

"For the arterial blood, as it passes out from the heart to be distributed throughout the body, carries with it the oxygen which it has absorbed in the lungs. It arrives at the tissues charged with this vivifying principle, and the tissues immediately seize upon it and appropriate it to themselves. Thus the blood, as it passes through the circulation, gives up its oxygen and returns to the venous condition. There is, therefore, a double change going on incessantly in the blood in the different parts of the body. In the tissues it loses oxygen, and changes from red to blue; in the lungs it absorbs oxygen, and changes from blue to red.

"*Action of the Blood Globules in Respiration.*—Now the ingredients of the blood which are most active in producing this change are the *Blood globules.* It is these little bodies which take the oxygen from the air, and fix it in their own substance for the renovation of the blood. They are the carriers, which load themselves with oxygen in the lungs, to transport it afterward to distant parts in the current of the circulation. As all the color of the blood resides in them, we easily see why this color should change with the changing constitution of the globules themselves.

"It is by the process of respiration, accordingly, that the blood is kept constantly renovated and restored to the arterial condition.

" *Quantity of Oxygen Consumed.*—The importance of oxygen to the living body is shown by the quantity which is consumed. At every inspiration one cubic inch of oxygen is withdrawn from the air and absorbed by the blood. This amounts in the course of an entire day to about 17½ cubic feet, or by weight a little over one pound.

"*Evolution of Carbonic Acid.*—But, at the same time that oxygen is absorbed from the air in respiration, another substance makes its appearance in the lungs, and is expelled with the breath. This is *carbonic acid.* It is a gas, like oxygen, but differing from it in its properties. It is the same gas which is formed in the fermentation of bread, wine, beer, and all substances containing sugar. It is produced from burning coal and candles, and many other combustible bodies. It is sometimes exhaled from the surface of marshy pools, and often collects at the bottom of old wells. It is not fit for respiration; and when a man is accidentally caught in an atmosphere composed of carbonic acid, as sometimes happens in cleaning beer-vats or in repairing old wells, he at once becomes insensible, and soon dies by suffocation.

" This gas, as we have said, is found in the breath. No less than one twenty-fifth part of the air passing out of the lungs consists of carbonic acid. This is immediately diffused through the atmosphere, or carried away by its movements; and the fresh air then taken into the lungs is again loaded with carbonic acid and expelled in its turn. This process goes on with every successive respiration; so that in the course of an entire day the amount of this gas discharged with the breath is nearly 15½ cubic feet, or by weight about one pound and a half.

" Now the carbonic acid so produced is formed in the tissues. It is absorbed from them by the blood, carried by the blood to the lungs, there exhaled into the pulmonary vesicles, and finally discharged with the breath. It is a useless and exhausted material which the tissues have rejected, and which is therefore expelled from the body in the process of respiration.

"*Exhalation of Water and Animal Vapors with the Breath.*—Besides carbonic acid, the breath also contains a peculiar animal vapor, which is produced in the interior of the body. Though this vapor is in very small quantity, it is sufficient to give to the breath a faint but perceptible odor. There is also some water discharged from the lungs in a gaseous form. The breath therefore is damp; and if we breath upon a mirror, its polished surface becomes dimmed from the deposit of the watery parts of the expired air.

ANIMAL HEAT.

The temperature of the body is about 100 *degrees Fahrenheit.* This temperature remains the same in winter and in summer, in the Tropics and at the Poles.

The animal heat is not peculiar to man. It is a quality of all other animals. Those animals which, like reptiles and fish, have a temperature much lower than that of man, are called *cold-blooded.*

Animal heat is the result of *all the chemical changes of nutrition going on in the body.*

Some organs of the body are warmer than others. The liver is now regarded as the warmest of the organs.

Animal heat is regulated by the *perspiration.*

There are in the body over 2,000,000 perspiratory glands. The length of tubing connected with them has been estimated at *two and a half miles.* Through these glands the perspiration is always being secreted. Most of the time it is invisible and insensible. When the system becomes over-heated, the amount of perspiration is increased, and *evaporation* ensues. Evaporation *produces cold*, and thus the body is kept at its normal temperature amid the extremes of heat and cold.

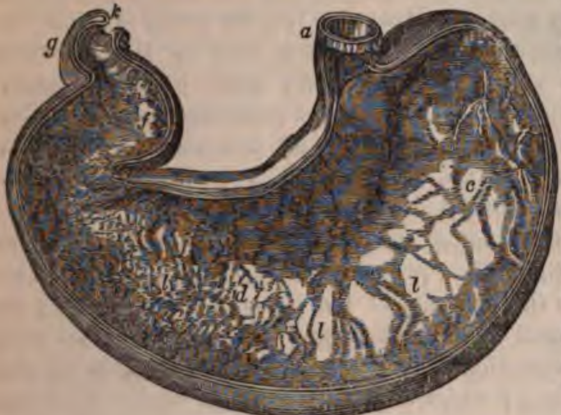
If the body from any cause is cooled down even a few degrees below 100 Fahrenheit, *death* is the sure result.

ORGANS OF DIGESTION.

These occupy, for the most part, the great cavity of the abdomen, and are, principally, the Stomach, the Intestines, Liver, Spleen, and Pancreas, or Sweet Bread.

THE STOMACH.

The stomach is a large bag or pouch for receiving the food. It is situated a little below the diaphragm, and has two muscular tubes or pipes opening into it. One of these, leading from the back part of the mouth down through the chest into the stomach, opens into this organ at the left side. This tube is called the œsophagus. It runs between the air-tube and the spine, and conveys the food from the mouth into the stomach. The stomach is a highly irritable and sensitive organ, having numerous muscular fibres entering into its composition, and being plentifully supplied with nerves. On its outside it is covered by a membrane called peritonæum, because it lines the abdomen, and contains the different digestive organs within its fold. This membrane not only sustains those organs in their proper situations but also affords a fine mucous fluid for keeping their surfaces constantly moist, thus to prevent injuries which would otherwise arise from friction. From the internal surface of the stomach there is a fluid constantly secreting, called the gastric juice, which has the peculiar properties of dissolving and attenuating the food before it passes into the intestines.



EXPLANATION OF FIGURE IV.

a	End of gullet.
c	Large end of stomach.
d	Cavity of the stomach.
fg	Lower or pyloric end of stomach.
k	Muscular band round pyloric end.
l l	Folds of mucous membrane of stomach.

THE INTESTINES.

The intestines are a long membranous and muscular canal, which arises from the right orifice of the stomach, and is generally five or six times the length of the body, forming many circumvolutions in the cavity of the abdomen, which it traverses from right to left, and again from left to right. Their structure is not unlike that of the stomach, being composed partly of muscular and nervous fibres, and possessing a high degree of irritability, as may be seen by their worm-like motions, even out of the body after death, when pricked with a needle, or otherwise stimulated. Soon after the intestinal canal goes out from the stomach, an oblique opening may be perceived by which the fluids from the pancreas and liver are poured into the intestine for the purpose of mixing with the food as it passes downwards. That the descent of the aliment may not be too rapid, by which the body would be deprived of a supply of nutrition sufficient for life and health, the inner coat of the intestines is thrown into a number of plaits, admirably fitted to retard the progress of food, till its nourishing properties are absorbed by the proper vessels. The whole internal surface of the intestines is kept constantly moist by the discharge of a mucous fluid, which favors the proper descent of the alimentary pulp, and helps to secure these organs from injury. The intestines and stomach have a structure very similar to each other;

so that the description of one applies to the other with sufficient accuracy for our purposes.

They have three coats. The internal one has been described as secreting a defending mucus. Here open into the cavity of the intestines those small absorbing vessels which take up the nutritive particles; they are called lacteals. They arise from the upper intestines principally. Next to this is the muscular coat, the fibres of which run in two directions. The one set embraces the intestines as small circular bands, or nearly so; and their purpose is obviously to shorten, by their contractions, the diameter of the intestines. Other fibres take a longitudinal course and lessen its length. The combined action of these fibres produces the vermicular or worm-like motions, and propels the contents of the intestines downwards; as the parts are stimulated by the distention of the food. The last coat is the peritonial, or investing one; it is a common covering to all the contents of the abdomen; which it at the same time lines. To cover the intestines it rises double from the spine, to which it is attached. It passes some distance before it reaches the intestines. These it embraces and slings in its fold, as an injured arm is slung from the shoulder. Between the spine and the intestines, it is seen like a thin and transparent membrane, allowing a sufficient motion to their different convolutions, without permitting them to become confused and entangled.

This is the mesentery, which is thus found to be a double membrane, including between its laminæ arteries and veins, nerves and lacteals, all ramifying with exquisite minuteness and delicacy.

THE LIVER.

This is the largest gland in the body, of a dusky red color, situated immediately under the vaulted cavity of the diaphragm, chiefly at the right side, but having the thin edge of its left lobe over the right side of the stomach. Anteriorly it is convex. Posteriorly it is concave. It is very thick in its superior part, and thin in its inferior. The upper side adheres to the diaphragm, and is fixed to this and to the breast-bone, by a broad suspending ligament. It is also tied to the navel by a ligament, formerly the vein by which the fœtus received nourishment from the mother.

The liver secretes a dark-colored fluid called bile. For this purpose it is supplied with a large quantity of blood. Most of the veins of the other viscera of the abdomen, instead of returning their blood to the heart, agreeably to the general laws of circulation, by the great returning veins, run forward towards the liver, where they unite in one large trunk, called vena porta, and which soon after enters this gland, and is ramified throughout its substance. Here this great vein performs the office both of an artery and a vein; for like the latter it returns the blood from the extremities of arteries, while like the former (and by a singular exception) it accomplishes secretion. Besides this vena porta, which furnishes the materials for the secretion of bile, the liver has an artery of large size, for the purposes of nutrition to the organ itself; which, it would seem, could not be effected by the venous blood of the vena porta.

The bile, after being separated from the mass of blood in the liver, is conveyed by very minute excretory ducts into larger ones, which also convey it into one great duct or channel, and which, as we before observed, opens into the intestines not far from the stomach. There is attached to the lower part of the liver a little membranous bag, shaped like a pear, and which, as a small reservoir, contains a portion of the bile secreted in the liver. Its neck is continued in the form of a canal, running to unite with that of the liver, when both enter the intestine, and pour in their contents by a common opening. With respect to the precise use of the bile physiologists are not determined. It seems to perform some important part in the economy, and especially in the conversion of food into chyle, since that fluid is not separated until the pulpy contents of the stomach have been mixed with bile and the pancreatic juice. It certainly stimulates the intestines to act; for when the entrance of bile into the intestines is prevented by gall-stones or any other obstructing cause, the bowels are costive. We know, too, that many of our diseases, particularly those which we experience in hot climates, arise from derangements of this organ.

Between two and three pounds of bile are secreted every day.—It is somewhat remarkable that we have not as yet found out what is the precise function of the bile. We know that it is being secreted all the time, and not periodically like the gastric juice, but in the largest quantity during the process of digestion. It can always be detected in the intestines, before meals as well as immediately after.

It does not seem to aid digestion.—Its own elements are changed, transformed in the intestines, and are then absorbed and taken into the circulation. The secretion and flow of the bile are necessary to life. Experiments on animals have shown that if the flow of bile into the intestines ceases, weakness and death are the result.

The production of sugar.—Sugar is produced in the liver, is absorbed by the blood-vessels of that organ and mingles with the blood in the hepatic veins. This sugar is soon decomposed in the circulation. Carnivorous animals, that eat no starch, yet have sugar formed in the liver.

The liver is a very large and important organ, but it is hardly worthy of the importance that is sometimes given to it. It is charged with being the cause of most of the maladies of the human race. All this comes from our ignorance. We as yet know but very little about the liver. We know that it produces *bile* and produces *sugar*. The precise functions of this bile and sugar we do not know.

THE PANCREAS.

This is a gland, in structure similar to the salivary glands. It is placed behind the bottom of the stomach, towards the first vertebra of the loins, with one end pointing towards the spleen, and its other extremity extending forwards. It is about eight inches in length, two or three broad, and one in thickness; has a yellowish color, inclining to red, and secretes a fluid resembling the saliva, by a duct which enters the intestine, together with the biliary canal.

THE SPLEEN.

The spleen is situated immediately under the diaphragm, above the left kidney, and between the stomach and ribs. Its use is unknown. So unimportant, however, is its function in the animal economy, that Cheselden asserts it may be taken from dogs without any marked inconvenience. A case has been recently reported where the spleen was entirely removed, yet the patient lived and recovered.

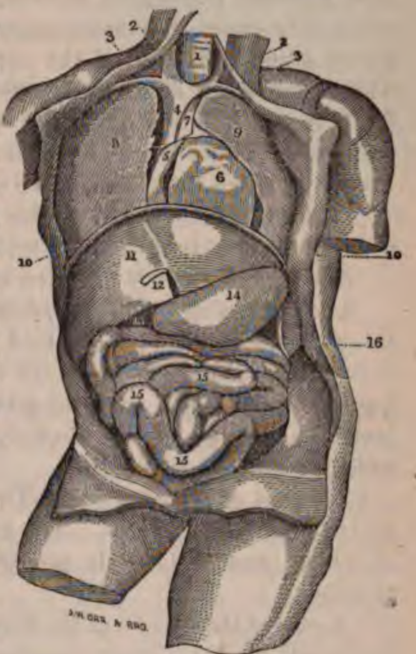
The spleen is an organ that has been very much slandered. By the ancients it was supposed to be the seat of *melancholy*; and even now the words "spleeny," "splenetic," are used to signify a person of a grouty or ugly disposition. But modern research has made it more than probable that the brain and nervous system, or sympathetic nerve, are at fault in hypochondria and melancholy.

We do not know that diseases of the spleen ever directly cause the "blues," although it is by no means impossible that they may do so. The truth in the matter probably is, that the same diseased condition that causes the spleen to be diseased, also causes the nervous system to be deranged.

THE OMENTUM OR CAUL.

There is a broad, thin, and transparent membrane arising from the inferior border of the stomach, and reaching down as far as the navel; it is every where double, consisting of two thin membranes, joined by cellular texture, in the cells of which great quantities of fat are sometimes deposited. The secretion of this fat is performed in the most simple manner. The fat is distributed very unequally in this membrane, it being in some places quite thin and transparent, and in other places above an inch thick. The caul of calves gives a beautiful representation of this fact.

The use of the caul is principally to interpose itself between the peritoneum, the intestines, and the stomach, to keep all these parts moist, warm, slippery, and to prevent their adhesion.



EXPLANATION OF FIGURE V.

REPRESENTING THE VISCERA OF THE CHEST AND ABDOMEN.

1. The Trachea or Windpipe, before it divides to plunge into the substance of the Lungs.

2. The internal Jugular Vein returning the Blood from the inside of the head. It joins the

3. Subclavian Vein, conveying the Blood which has circulated through the Arm; both form a common trunk, the

4. Descending Cava, which pours its contents into the

5. Right Auricle of the Heart, which receives also the Blood from the rest of the body by a large Venous Trunk, the Ascending Cava, not to be seen in this view.

6. The Right Ventricle. The Left Ventricle cannot be seen, as it is situated behind the parts now in view.

7. The Aorta, or Great Artery of the Body.

8. The Right Lobe of the Lungs, part of which is cut off to show the great Blood-vessels; as is the Mediastinum, a Membranous Partition between the two Lobes of the Lungs, and dividing the Chest into two distinct cavities. The Pericardium also is removed to show the Heart more distinctly.

9. The Left Lobe of the Lungs.

10. The Diaphragm, or great Muscle of Respiration, separating the Chest from the Abdomen, and upon which the Heart is seen to rest in its natural position. The Diaphragm is observed to be convex towards the Chest, and when we inspire this convexity is lessened, so that the Cavity of the Chest is lengthened; the Intestines are pushed down, and are protruded at the same time, because the Abdominal Muscles are then relaxed.

11. The Liver, which is suspended to the Diaphragm by a Ligament.

12. The Round Ligament, or what was the Umbilical Cord before birth; now rendered solid.

13. The Gall Bladder.

14. The Stomach pressed to the left side by the Liver.

15. The Small Intestines.

16. The Spleen.

DIGESTION.

The processes of Digestion.—Digestion is a complicated process

The first division of the alimentary canal is the mouth. Here takes place the process of *mastication*. By the action of the teeth the food becomes thoroughly chewed, triturated, and divided. By the saliva it becomes thoroughly moistened. This saliva is secreted in glands situated in front of the ear, under the jaw and the tongue. The saliva flows at all times, and keeps the mouth moist, but it flows in much larger quantities when the operation of chewing is going on. Were it not for this process of mastication solid food would not reach the stomach in a condition to be easily digested.

It is the opinion of Dr. Austin Flint, Jr., that the saliva converts some of the starch of the food into sugar.

About *three pounds* of saliva are secreted by every adult daily.

2. *Swallowing.*—The *œsophagus* is a tube extending from the throat to the stomach. The food is carried down through this tube involuntarily, by the action of the muscles. Sometimes, in "swallowing the wrong way," the food gets behind the little valve that protects the opening of the wind-pipe, and then we cough and hack until the particle is expelled.

3. *Action of the Stomach.*—The stomach is composed of *muscles* and of a *lining membrane*. The membrane is filled with *tubules*, out of which *gastric juice* is poured as soon as the food enters the stomach.

Action of the muscles of the Stomach.—The muscles of the stomach are partly circular, partly longitudinal. The presence of food in the stomach not only excites the flow of the gastric juice, just as it excites the flow of saliva in the mouth, but also stimulates the muscular coat into action, just as it stimulates the muscles of the œsophagus into action and produces involuntary swallowing.

This action of the muscles of the stomach is to produce a kind of churning motion, and is called the *peristaltic* action. The effect of this action of the muscles is to aid the secretion of the gastric juice, and to cause it to thoroughly mix with the food.

The gastric juice is composed of water, pepsine, lactic acid, and some albuminous and mineral ingredients. The action of this juice on the food is to reduce the albuminous substances of the food to what is called *albuminose*. The *starchy* and *oily* portion of the food is unchanged in the stomach. As fast as the albuminous substances become transformed into *albuminose* they pass out of the stomach, in the form of *chyme*, into the small intestines.

This chyme consists:

1. Of the albuminose, mixed with gastric juice.
2. Of the starchy matters of the food.
3. Of the oily matters of the food.

The intestines secrete what is called *intestinal* juice. The action of this is to change the starch of the chyme into sugar.

PANCREAS AND PANCREATIC JUICE.

The pancreas, an organ situated behind and below the stomach, secretes *pancreatic juice.* This is poured into the intestine, acts upon the *oily* portion of the food, and changes it into an *emulsion* called *chyle.*

The food is carried down by the *peristaltic* action of the muscular coat of the intestines. This muscular coat is composed of circular and longitudinal layers, and their action is analogous to the peristaltic action of the œsophagus and of the stomach.

COMPLETION OF DIGESTION IN THE INTESTINES.

The process of digestion is completed in the intestines. As fast as the food becomes thoroughly digested, it is taken up by the absorbents and carried into the circulation. The substances which are not digestible are carried into the large intestine, and rejected from the system. When digestion is not well performed, constipation or diarrhœa may result. Therefore, in order to cure them, it is necessary to cure the indigestion of which they are the results.

The digestion is very much influenced by the condition of the mind. Many years ago, Dr. Beaumont had a patient with a permanent gunshot wound in his stomach, through which he could easily watch the processes of digestion.

He observed that bad news, or anything that made a disagreeable impression on the mind, arrested the secretion of the gastric juice, and consequently interfered with digestion. We all know by experience that mental distress or annoyance impairs the appetite and brings on attacks of indigestion. Dyspepsia is therefore very frequently the result of over-work and over-worry.

COURSE OF THE CHYLE TO BE MIXED WITH THE BLOOD.

The intestines, as we have observed, are generally five or six times the length of the body, and their internal surface is increased by the plaiting of its internal coat. From a large proportion of this great surface the new-formed chyle is constantly absorbed by the lacteals, which are minute transparent vessels, arising in infinite number from the inner surface of the intestines.

These vessels imbibe their chyle by absorption; for this nutritious fluid, being pressed against their mouths in the various motions of the intestine, acts as a stimulus, when these delicate and highly sensitive organs contract, and propel the fluid forwards beyond the first set of valves, which prevent its return. It would seem, however, that those orifices of the lacteals act by some other power besides capillary attraction, inasmuch as they select the chyle from the rest of the chyme, and do not take up some fluids that have been introduced into the intestines for the purpose of experiment. Thus the lacteals perform absorption in the same manner as do the lymphatics; nor is there any difference in the construction or functions of these vessels. There is however a difference in the color of the fluids which they convey.

From the intestines the lacteal vessels convey the chyle along the membrane called mesentery, which extends from the intestine to the spine, to sustain the former in its proper place. Here they may be easily seen in an animal killed two or three hours after feeding, for then they are distended with the new, white chyle, which is going forwards into the circulation. Passing through this membrane, the lacteals run onwards to the thoracic duct. Into this duct the lacteals empty their contents. Soon after, mixing with the lymph, conveyed to this tube from the various parts of the body, both fluids are carried along the thoracic duct to its opening into the vein, and there are poured together into the circulation. Before it reaches the thoracic duct, the chyle enters one or more glands, where it undergoes some unknown change. These glands are attached to every part of the absorbent system; more especially to the lacteals. They are very numerous at the root of the mesentery.

The chyle now mixing with the blood becomes soon assimilated. From the vein where it enters, it is carried directly to the right side of the heart, whence it is propelled into the lungs, to imbibe the oxygen or vital portion of the atmospheric air, and to part with some of its carbon; returning to the heart again, now formed into perfect blood, it is forced by the left side of this organ along the arterial tubes, to distribute life and health to every part.

NUTRITIVE CHANGES WITHIN THE BODY.

These are of three kinds, *Assimilation, Secretion, and Excretion.*

Assimilation is the making of the food into tissues. The tissues of the body vary in their composition, and the *chyle* which is made from the food is different from the tissues. Each tissue takes from the blood just what of the inorganic substances it needs for its own nutrition.

Each tissue also takes from the blood just what *organic* substances it needs, and converts it into its own substance.

In this way, by this perpetually recurring miracle, the body is nourished. It is marvellous chemistry, and seems to be almost past our finding out.

Secretion is also a wonderful process. Secretions come from the blood, are prepared in certain organs, for certain purposes. The bile, the gastric juice, the tears, the saliva, the mucus of mucous membranes, the perspiration, the wax of the ear—all these are secretions.

Secretions are formed in glands. These glands are composed of follicles grouped together.

EXCRETION.

Every act, every thought, every feeling, is attended by a change of tissue. This change of tissue necessarily causes waste. The effete products of these changes are called excretions. Excretion is as healthy a process as *assimilation* or *secretion*. It is the elimination of the waste matters from the system.

The principal excretions are:

1. *Urea.*—This is found in the blood, and is excreted by the kidneys to the extent of about one ounce per day. The amount varies with the constitution of each individual and with the amount of work that is done.

2. *Carbonic Acid.*—This is exhaled by the lungs, together with some watery vapor.

The presence of carbonic acid and this watery vapor, together with the perspiration, makes the air of crowded assemblies so disagreeable and pernicious.

Besides urea and carbonic acid and watery vapor of the lungs and skin, there are the fæces, and there are also found in the urine urate of soda, creatine, creatinine, and various salts.

It is estimated that seven pounds of material are absorbed and discharged every day by a man of average size and in good health. In about 20 or 25 days a quantity equal to the whole body passes through the system.

THE KIDNEYS.

There are two glandular bodies, situated in the loins, contiguous to the two last short ribs, and lying close to the spine; the right under the liver, and the left under the spleen.

In each kidney three kinds of substance may be distinguished.

The outer part is glandular, beyond this is tubular, and the inner part is papillary or membranous.

The kidneys drain the system of its redundant water. For this purpose a considerable portion of the blood is constantly passing into each kidney by an arterial branch, which runs directly from the aorta or main artery of the body into this organ. Here, in the glandular part of the kidney, the blood undergoes a change, having its superfluous water, together with some saline bodies, separated, and is itself again returned to the circulation by means of a vein which goes to the great ascending vein of the body. The water being now strained from the blood is conveyed by an infinite number of small tubes, constituting the second substance of the kidney, out of its glandular part. These tubes, as they approach the inner substance of the kidney, gradually unite together; and thus forming larger canals terminate at length in ten or twelve little protuberances, called papillæ, the orifices of which may be seen with the eye. These papillæ open into a small reservoir, called the pelvis of the kidney, and formed by a distinct membranous bag which embraces the papillæ. The water being conveyed by the different tubes into the reservoirs of the kidneys is farther conducted by two large membranous canals, each about the size of a common writing-pen, and which go out from the hollow sides of the kidneys. These canals open into the back and under part of the bladder, whither they convey the redundant water of the system, and where, as in a great reservoir, it remains till a quantity is collected sufficient to induce a contraction of this organ, by which the contained fluid is necessarily expelled.

The bladder is a hollow, membranous, and muscular organ, situated at the bottom of the abdomen, immediately above the ossa pubis.

It is lined by a membrane which is defended by a mucus secreted from its inner surface. Next to this is its muscular coat, formed of fibres running in various directions, to contract it when filled, and to empty it completely. The outlet of the bladder is called its neck. Here the muscular structure is more obvious, and by the action of its fibres, which embrace the organ, the passage is closed until the bladder is so distended, that the muscles of its upper part by their contraction overcome those at the neck of the bladder, and expel the urine.

The canals conveying the urine from the kidneys, are called ureters. By a very simple but effectual mechanism, they convey their contents without a possibility of their being returned, merely by passing obliquely about half an inch between the muscular and inner coats; which oblique entrance answers the purpose of a valve.

Part of the bladder is covered by the lining membrane of the abdomen; which having descended to the lower and fore-part of that cavity, is reflected upwards over the top of the bladder. The neck of the bladder leads to the uretha or canal, which guides the urine altogether out of the body.

The kidneys and bladder are the seats of a most distressing disease, when calculi or stones are deposited from the urine, either by a constitutional tendency, or from the presence of a nucleus, on which the matter is incrusted. Any part of the urinary system may contain them. They are much more commonly found in the bladder. They may be removed by an operation, the most formidable, and the most painful one in surgery. It consists in making an artificial opening near the neck of the bladder, and extracting the irritating substance.

Happily, much talent and skill have combined to render this one of the most successful and beneficial operations practiced by the surgeon.

THE UTERUS AND ITS APPENDAGES.

The uterus, in form and bulk, resembles a middle-sized pear. The broader part is called its fundus, the narrower extremity is its neck, which is its lower part, and is closed by a chink leading to the vagina, or canal communicating with the outside of the body.

The uterus is placed immediately behind the bladder.

Besides its lower orifice there are two smaller ones leading from its fundus, on each side, to corresponding tubes, which are called the uterine tubes, and which terminate at a short distance in open mouths. The extremities of these tubes have several small finger-like projections, which are loose, and allow of their grasping any body to which they may become attached. These tubes are bent towards, (without, however, being attached to,) two small bodies of an egg-like form, placed on each side the uterus, called ovaries. These are firm, and without any cavity, but they have several small vesicles imbedded in their substance.

The uterus, its ducts, and the ovaries, are connected together, and covered by an enveloping fold of the peritoneal membrane, which after having covered the top of the bladder, descends in order to re-ascend over the uterus, and to be continued over its whole surface and its appendages.

PREGNANCY.

When an intercourse takes place between the sexes, the whole uterine system experiences a peculiar excitement. The fibrous extremities of the uterine tubes grasp the ovaries, and squeeze out of them one of the small bodies we have described. This is the origin of the fœtus, and is conveyed into the uterus along the channel, probably by a muscular power. Then the female constitution experiences striking changes. The monthly indisposition is stopped. The uterus gradually enlarges to a prodigious size, and a far greater quantity of blood circulates through its vessels. Its internal surface pours out lymph, which is the bond of union between it and the vesicle, previously detached from the ovaries; for blood-vessels shoot into it from the uterus, and enlarge its dimensions. It is now called the ovum. When it is large enough to enable us to distinguish its parts, we find it consists of membranes containing a fluid, in the midst of which floats the fœtus; at first gelatinous and shapeless. Gradually its parts are developed, and we find that one extremity of the ovum is attached to the uterus by a thick and spongy mass. This is the placenta, the organ through which the future infant receives its nutrition in the womb. From the centre of the placenta a cord is continued to the navel of the fœtus, along which run the trunks of the vessels of which the placenta is made up.

Usually, when nine months have elapsed, the muscular fibres of the uterus contract upon their contents, and labor commences. The lower orifice of the womb, (during pregnancy sealed by lymph,) now gradually opens. The cone-like form which the membranes of the ovum assume, acts as a wedge, when their fluid contents are pushed against the orifice, by the contraction of the uterus. While the opening dilates, the membranes burst, the fluid runs off and lubricates the passage.

The dimensions of the head are nearly proportioned to those of the outlet, and it can escape with facility only in one direction.

The structure of the head, being made up of many pieces, enables it to be moulded to the outlet. The bones overlap each other, and the size of the head is much lessened. When the head is released, the great difficulty of labor is accomplished, and the infant is quickly born. The placenta and membranes usually follow the child in a few minutes. The uterus contracts, and is soon reduced to its former size.

THE FŒTUS, AND ITS CHANGES.

The entrance of the infant into the world is accompanied with great changes in its mode of existence, and with curious alterations in its internal structure to fit it for its new situation.

In one word, it is now a breathing animal instead of floating in a fluid.

Part of its organization is rendered superfluous, and gradually disappears; while other parts, which, in its original state, were inactive and useless, are now called into immediate use.

The more striking changes we have hinted at, are connected with the circulation of the blood, and the state of the lungs. These it will be interesting to point out.

The placenta, before mentioned, the organ by which the fœtus receives from the maternal blood what is necessary for its growth, is composed of blood-vessels, yet these, it is to be noted, do not communicate directly with those of the mother; and the mode of communication is still a mystery. The cord which connects the placenta to the navel of the fœtus, is called the umbilical cord. It has generally three blood-vessels twining around it, namely, two arteries, and one vein. If this cord is by accident torn asunder after birth, and the dividing end towards the fœtus is not bound up, the infant bleeds to death; but the mother does not lose blood, although the placenta should be still attached to the uterus, and that end of the cord untied. The vein conveys the blood from the mother to the fœtus, after it has gone through a process in the placenta, analogous to that which the lungs perform after birth; and, probably, it is by the same means supplied with new materials for the nutrition of the fœtus. The arteries bring the blood from the navel to the placenta, where they branch out very minutely, and are exposed to the influence of the maternal blood in cells contained in the substance of the placenta, from which the small ramifications of the umbilical vein arise.

The vein enters the fœtus at the navel, conveys its blood by a peculiar passage, termed the "venous canal," to the great vein, the vena cava, near to the heart. It enters the right auricle, and part of it passes by an oval hole into the left auricle. This opening (like the before-mentioned canal,) is peculiar to the fœtal state. It is intended to avoid the circuitous course through the lungs; these being now dense, compact, and impermeable to so much blood; for they are not yet inflated by respiration. Still, however, part of the blood enters the right ventricle; too much it would seem to find a passage through the lungs. On this account there is another canal provided, (termed in contradistinction to the former, the arterial,) connecting the pulmonary artery with the aorta. Therefore when the right ventricle forces its blood into the pulmonary artery, which leads to the lungs, part of it passes directly into the aorta without entering these organs, while a very small portion circulates through them.

In one of these two ways, all the blood gets to the left side of the heart, to circulate through the fœtal system. It enters the aorta, and just below the branching of that vessel in the pelvis two arteries originate (the umbilical) which pass out at the navel to carry the blood to the placenta.

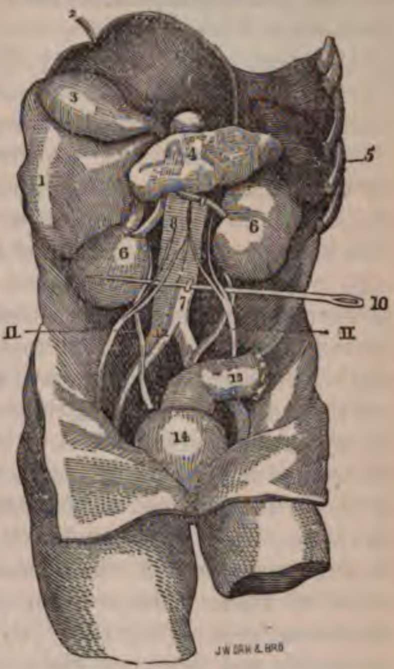
Having traced the circuit which the blood takes, we find this peculiarity; (which the fœtus has, in common with many animals, particularly the amphibious;) that it is not furnished with pure arterial blood in its arteries; for the umbilical vein mixes its pure blood with that of the vena cava before it gets to the left side of the heart, which dilutes it with venous blood.

Yet it is partly arterial blood which is conveyed by the umbilical arteries to the placenta, for it has not all circulated through the system, and thus become venous. This state of the blood always exists in frogs. These animals have (strictly speaking) but one heart; viz: an auricle and a ventricle. An artery rises from the ventricle, and branches into two; one goes to the lungs, the other is distributed through the body of the animal. The pulmonary artery brings back its now altered blood from the lungs towards the auricle, where it is mixed with the venous blood returning from all parts of the system; so that here also, as in the human fœtus, the blood is never purely arterial, nor purely venous.

In man and quadrupeds *after* birth the blood is carried to the lungs, and is purely venous blood, and circulates through their bodies when wholly arterialized. The reason for this remarkable difference is not ascertained; excepting, indeed, that there seems to be a pretty uniform connection between imperfect arterialization of the blood and languid exertion of the powers of life, as well as the converse of the proposition.

The fœtus also may be considered as having one heart, while the infant, when born, may be said to have two; one belonging to the lungs, and one to the general system. The communication by the oval hole in the fœtus, renders the heart in effect single, and its closure perfects the two circulations. In fact the right auricle and ventricle are of no use to the fœtal system; they are provided for the future wants of the child, and particularly for its breathing state; being wholly connected with the lungs, which are quiescent. When the connection with the placenta is cut off, the lungs come into play; breathing takes place, and the blood rushes through them. The venous and arterial canals, together with the oval hole, are superseded by new channels; the latter is closed up, and the former are gradually changed to solid ligaments, instead of being hollow tubes.

New supplies of food are now requisite, a bland, nutritious, and animalized fluid, is secreted in the mother's breasts; and nature, uniformly benevolent, has rendered the duties of a mother a source of exquisite gratification.



EXPLANATION OF FIGURE VI.

EXHIBITING THE DEEPER VISCERA OF THE ABDOMEN, BY THE REMOVAL OF THOSE FIRST IN VIEW.

1. The under Surface of the Liver.
2. The round Ligament by which the Liver is raised.
3. The Gall Bladder.
4. The Pancreas, lying upon and across the Spine.
5. The Spleen.
6. The Kidneys.
7. The Descending Aorta.
8. The Ascending Cava.
9. The Vein which returns the blood from the Kidney.
10. A Probe.
11. The Ureters, which carry the Urine from the Kidneys to the Bladder.
12. The Great Artery and Vein dividing into smaller vessels to go to the Lower Limbs.
13. The Lower Intestine, the Rectum.
14. The Bladder.

INTEGUMENTS OF THE BODY,

AND THEIR APPENDAGES.

The human body is protected and ornamented by a strong, pliable, and sensitive covering, which not only defends the parts underneath from external injuries, but also gives symmetry and beauty to the figure. This covering consists of several parts, each having its peculiar use and structure.

We begin with that which lies immediately above the muscles, or flesh, and which presents itself to view on removing the skin.

THE CELLULAR MEMBRANE AND FAT.

Between the skin and the muscles, (or flesh,) and the fibres of each muscle, is interposed a loose, oily substance. It is continued without interruption over the whole exterior of the muscles, filling up their depressions, and affording a smooth and regular surface for the skin to lie upon. This substance is composed of a cellular texture and fat. The latter is fluid in the body, and is deposited in the cells of the former, for facilitating muscular motion. Though found in the greatest quantity in the cells of the membrane, filling up the space between the most external muscles and the skin, it may be met with in several other parts of the body.

The cellular membrane, which contains this fat, is not confined to any particular part, but is to be found at every point of the body. Its use and importance are very great. It serves as a bond of union, by tying and fastening all the parts together; (yet in such a manner as not to prevent or obstruct their necessary motions;) to contain fat, as under the skin and other places, or, marrow, or serum, or a thin vapor, to render parts smooth, moist, and flexible; and to hinder them from growing together. It yields a commodious way, or road, for vessels and nerves to glide along. It furnishes a considerable part of the linings of the great cavities of the body, and immediately covers and envelops each particular viscus of the body.

Fat is deposited very unequally throughout the body. Among the viscera it is sometimes in great abundance, particularly where a constant and equable motion is required. Hence the heart is imbedded in a cushion of fat, and well defended from agitation or interruption. The intestines slide over one another with great facility, owing to the masses of this substance which are interspersed among them. On the outward surface of the body, between the flesh and the skin, it is more uniformly diffused; although even here it is in in some parts more abundant than in others; as on the soles of our feet, where it serves as a cushion on which the frame rests. It fills up the chinks and crevices of the muscles, and gives that gently undulating outline to our bodies, on which the beauty of the human form depends. The artist finds extreme difficulty in endeavoring to trace its flowing curves even when we are at rest, and still more to seize its flitting forms in the rapid succession of our motions, or in the greatest efforts of the muscular power. The fat undoubtedly answers other purposes. It defends the parts of more delicate organization from external impressions that would injure or destroy them. It protects them from heat and from cold.

In health and middle age it is accumulated, perhaps, for the supply of the system, when other sources fail. Hence it is absorbed in disease, and taken into the circulation. In old age its quantity lessens, when the appetite and the other functions give way.

THE SKIN.

The skin covering the human body is found to consist of three separate parts or layers, which lie in close contact with each other, and adhere by means of numerous small vessels, and fibres which pass from one to the other.

The first layer is called the cutis, or true skin, to distinguish it from the scarf-skin, which is external to it. The cutis is spread immediately upon the adipose (fatty) membrane which we have described, and is always white whatever may be the complexion. This skin is exceedingly vascular, and is endowed with exquisite sensitiveness, being supplied with numerous nerves, whose papillæ stand out, and are the seat of feeling, as we have observed. It is extremely elastic, stretching, as in dropsy, many feet. After tapping, it returns nearly to its natural dimensions. It is thickest in those parts intended by nature to bear weight or pressure, as on the back, the soles of the feet, and the palms of the hands. It is thinner on the fore-part of the body, on the inside of the arms and legs, and where its surfaces touch opposite surfaces. On the lips it is extremely thin, so as to allow the color of the blood to shine through them. Under the inferior surface of this skin, are situated numerous small glands. They secrete an oily fluid, which they pour out upon the external surface of the skin, by means of excretory tubes, to keep it soft and flexible.

It is this skin in animals, which being prepared by tanning, constitutes what is called leather.

Immediately on the surface of the true skin, between it and the scarf-skin, is interposed a mucous substance, on which, as we have said, depends the color of the body. It is black in the Negro, of a copper-color in the Mulatto, brown in the Egyptian, white in the Albino, and in the inhabitants of cold climates. With us it becomes brown in those exposed to the beams of the sun, and particularly so when reflected from the surface of the water, as in a sea voyage, or from the white sands, as in Africa. The color of this mucus is transmitted from parents to their children, but is capable of great modifications. The offspring of a black man by repeated intermarriages with white women, will in the fourth generation become perfectly white, and the converse of this is equally true.

Externally to this mucous membrane lies the cuticle or scarf-skin. It is a fine transparent, but insensible membrane, every where investing the body, and is the part of the skin which is raised in the form of bladders, by the operation of a blister. The use of this last covering of the body is to protect the delicate nervous fibres, which stand out from the true skin, from the external air; and also to modify their too great sensibility, by interposing itself between them and the body in contact. The cuticle is perforated by innumerable pores for the passage of the perspirable matter, as will be shown in the next article.

PERSPIRATION.

An important office of the skin, on the due accomplishment of which health very much depends, is to exhale from the body a part of the watery fluid it contains. For this purpose it has innumerable excretory vessels opening upon its surface.

That this exhalation, though frequently insensible, is perpetually going on, appears evident from a variety of phenomena. Hold a polished, dry, clean, rubbed, piece of metal, close (without touching) to any bare part of the body, in warm weather, and it will be quickly sullied. Wipe it clean and dry, and hold it again to the part, and the same effect will be constantly renewed. Put your naked arm into a wide-mouthed chemical glass vessel, very dry, and you will soon see the internal surface of the glass dimmed with the exhalation from the limb; and if it be kept long enough within the glass, there will be seen streaks of moisture trickling down its sides.

From this experiment it is evident that the matter of perspiration has water for its basis, and that this water is constantly flying off in subtle vapor; or when the action of the perspirable vessels becomes increased either by exercise or heat, the perspiration becomes more sensible, and is seen to exude from the skin in large quantities.

The uses of perspiration are to free the blood from its redundant water; to expel from the body those particles, which by repeated circulation, have become acrimonious; and to cool, and regulate the heat of the system, by keeping up a constant evaporation.

Besides these exhaling vessels, the skin, (as we before observed,) is full of the mouths of lymphatic vessels. They constantly inhale their vapors from the surrounding air, when it is not very cold; but more especially when the air is damp, the body unexercised, and the mind oppressed with grief. This absorption of the skin is proved by the operation of medicine pervading the air, or applied to the skin;

such as the vapors of mercury, turpentine, &c., by the fatal effects of contagious or other poisons entering through the skin, and by other facts.

The quantity of this inhaled matter in animals it is difficult to ascertain, because it is not known how far the lungs are concerned in this process of inhalation and exhalation.

It is a matter of greater certainty that the skin acts upon the air, as the lungs do, in depriving it of its oxygen, and in loading it with fixed air; so that it would seem to co-operate with them in changing venous into arterial blood.

THE NAILS.

Their origin is a subject of dispute; yet they seem to possess many properties in common with the scarf-skin; like it they are neither vascular nor sensible, and when the scarf-skin is separated from the true skin by any means, the nails come away with it. They appear to be composed of different layers, of unequal size, applied one over the other. Each layer seems to be composed of longitudinal fibres.

In each nail we distinguish three parts, viz.: the root, the body or middle, and the extremity. The root is a soft, thin, and white substance, terminating in the form of a crescent; the scarf-skin adheres very strongly to this part; the body of the nail is broader, redder, and thicker, and the extremity is of still greater firmness. The nails increase from their roots, and not from their upper extremity. Their principal use is to cover and defend the ends of the fingers and toes from external injury; they also strengthen those parts; and prevent their bending backwards when applied with force against any hard resisting body.

THE HAIR.

It arises from distinct capsules or bulbs seated in the cellular membrane under the skin. Some of these bulbs inclose several hairs, but more generally each hair has its own particular bulb. The hairs, like the nails, grow only from below by a regular propulsion from the root, where they receive their nourishment. Their bulbs, when viewed with a microscope, are found to be of various shapes. In the head they are roundish, and in the eye-brows oval. Each bulb seems to consist of two membranes, between which there is a certain quantity of moisture.* Within the bulb the hair separates into three or four fibrillæ (small fibres.) The bodies of the hairs, which are the parts without the skin, vary in softness and color according to the difference of climate, age, or temperament of body. They afford a light and ornamental covering to the head; serve as a defence to the delicate organs of vision, as in the case of the eyelids and brows; and also greatly adorn the figure by the richness of their color, and by the beautiful tresses which they form.

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* For illustrations and further explanations see *Diseases of Hair.*

MAN AS COMPARED WITH OTHER ANIMALS.

It is important that we should compare man with the animal creation, for several reasons.

1. Such a comparison reveals to us the fact that there is far less physical difference between man and the higher order of the animals than is commonly supposed.

Man resembles the apes in the processes of his conception and birth, in his mode of growth, in his manner of taking food before birth and after birth.

Man is formed from an egg. This egg develops into an embryo. The embryo becomes a child. The child grows into a man. The adult man declines into old age, and finally dies.

The common house dog also begins life as an egg. It passes through the same complicated and wonderful processes as the human egg, and becomes instead of a child, a puppy. The puppy is born, and grows to be a full-sized dog. The dog declines to old age, and finally dies.

The chicken, as everybody knows, begins its existence as an egg. It passes through the same processes as the egg of the dog; in turn a chicken grows into a hen; in its turn produces other chicks, and ultimately dies of old age.

The same is true with all the other animals that have backbones—frogs, snakes, lizards, fishes, dogs, cats, and monkeys.

2. *There are less intellectual differences between man and the higher orders of animals than is commonly supposed.*

The intellect of man, as all know, is the function of the *brain*, just as digestion is a function of the organs of digestion, or respiration of the lungs. (See *Brain.*)

The intellectual power of any man depends on the quantity and quality of his brain, just as his digestive power depends on the size and health of his stomach, or just as his breathing power depends on the volume and condition of his lungs.

The same law applies to animals. Animals have more or less brain. The first rudiments of the hemispheres in the brain appear in the fishes. There appears to be quite a regular gradation both in the quantity and the quality of the brain as we ascend the scale of the animal creation. The higher order of animals—dogs, horses, monkeys, and gorillas—have considerable amount of brain, although in quantity far inferior to that of man, and in quality probably still more so. The whale and the elephant are the only animals that have larger brains than man, but their superiority is far more than counterbalanced by their inferiority in quality.

Animals of the higher orders at least have the five powers of sensation, perception, memory, will, and judgment. Their great deficiency is in reasoning; their judgments seem to be mostly instinctive, yet they do not seem to be wholly destitute of reason.

The highest order of animals—the apes, gorillas, and chimpanzees—have a far less quantity of brain than man, and more especially in those portions that are supposed to be devoted to reasoning and comparison, and to the higher intellectual and moral faculties. The difference seems to be one chiefly of degree rather than of kind. The weight of the brain of man is about 50 ounces, and of the gorilla about 15 or 20 ounces. Idiots sometimes have very small brains—as low sometimes as 30 or 35 ounces—rarely lower than 30 ounces.

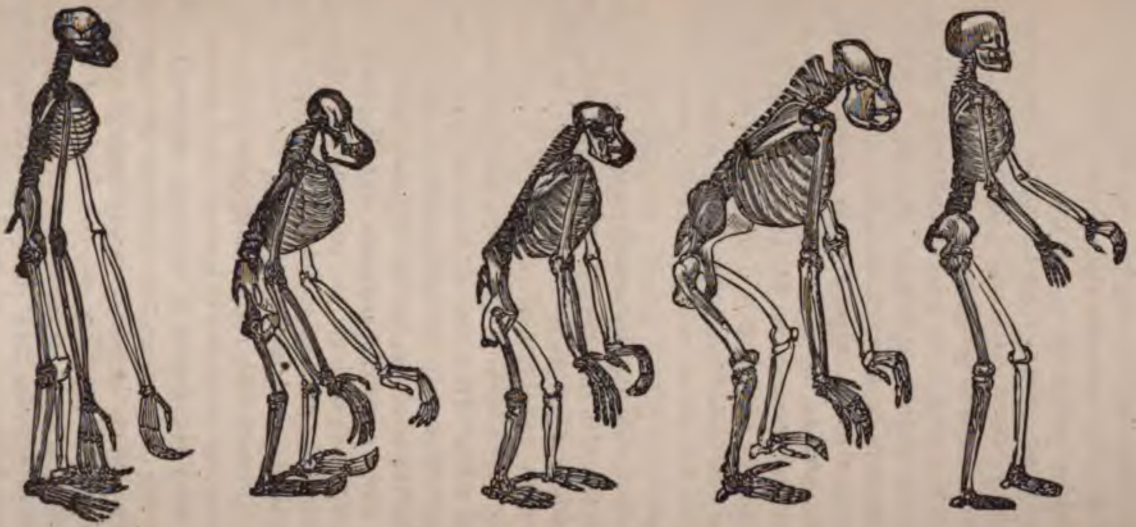
There is therefore a wide gulf in quantity between the highest type of monkey and the average order of intelligent man. There is probably a still wider gulf in the element of quality, though of that we are not as yet so well informed.

Man's superiority to the brute is seen, then, chiefly in the quality of brain. It is of a finer structure. It is richer in gray matter. It has more numerous folds. Its intimate structure is more complex. The microscope tells us that the human brain is composed of *eight* distinct layers, like the layers of an onion. These layers are composed of cells of every variety of shape, and connected by every variety of communication. The human brain is also rich in phosphorus. Examinations have shown that the brains of animals vary in their quality as well as in quantity with their intelligence.

Man is also superior to the animals in his method of speech. It is unfair, however, to deny the faculty of speech to animals. They have among themselves a language that expresses clear and definite ideas. The neighing of the horse, the lowing of the cow, the barking of the dog, the mewing of the cat, the singing of the bird, all are so many different kinds of speech.

So far as can be seen, then, the great structural difference between man and other animals is in *degree*, and chiefly, though not solely, in the quantity and quality of brain.

It is very true that man differs from the other animals immediately below him in the curves of his spine, the shape of his pelvis,



SKELETONS OF THE

GIBBON. ORANG. CHIMPANZEE. GORILLA. MAN.

(*From Huxley's "Man's Place in Nature."*)

DRAWN BY MR. WATERHOUSE HAWKINS, FROM SPECIMENS IN THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS.

the arch of his foot, the relative length of his upper and lower limbs, etc.; but all these are small matters. That which raises *man above the chimpanzee, the lemur, and the gorilla, is the quantity and the quality of his brain.*

Reduce the volume of the human brain one half, and the human race would be brought to the level of monkeys.

The accompanying cut, taken from Professor Huxley's work on "*Man's Place in Nature*," is exceedingly suggestive. It represents, side by side, man and the higher orders of apes.

There is probably as much difference between the quality of the brains of men and of animals, as there is between fine silk and linsey woolsey, or between a handkerchief of fine linen and one of coarse cotton. Chemistry and the microscope may yet settle this question beyond dispute.

Professor Schroeder van der Kolk has shown that there is a difference in the quality of the brains of different orders of the animal creation.

In order to find out the intelligence of animals, it has been thought to be necessary to take the weight of the brain as compared with the weight of their bodies. It is probable, however, that if we would, in all cases, accurately determine the exact quality of the brain by chemistry and the microscope, there would always be found a correspondence between that quality and the intelligence. On this subject I quote from a very able article recently published on this subject in the *North American Review*:—

"There is no action of the human mind which is not an act either of knowledge, feeling, or will. There is but a single faculty of willing, while our acts of knowledge and feeling are the product of several special and distinct faculties. In many of our complex mental operations, and even in some of those which appear to be the simplest, all the faculties of knowledge, the power of the will, and some one or more of the feelings, are brought into action. In the following instance of brute intelligence we shall find, upon careful consideration, that the case is precisely the same. The story will be given substantially in the words of the journal from which it is taken.

"In the Garden of Plants, in London, the keepers were recently engaged in destroying a great number of rats, when one of them escaped and ran to the spot allotted to the elephant. Seeing no other refuge, in the twinkling of an eye the rat snugly ensconced himself in the trunk of the elephant, very much to the elephant's dissatisfaction. He stamped his foot and twisted his trunk around like the sail of a windmill, and then stood suddenly still, apparently reflecting on what it was best to do. Presently he ran to the water-trough where he was accustomed to drink, plunged in his trunk and filled it, and then raising it dashed out the rat in a torrent like that which issues from the hose of a fire-engine. When the rat struck the ground, the elephant seized him and made him undergo the immersion and projection four times. The fourth time the rat fell dead. The elephant, with a quiet but majestic air, crushed it under his foot, and then went round to the spectators to make his usual collection of dainties.

"In considering the mental operations involved in, and indicated by, the actions of the elephant in this contest, we will begin with the knowing or cognitive faculties. In the first place, he could not have become aware of the presence of the rat in his proboscis, except through an act of perception,—that faculty which gives to the mind its knowledge of external things. But perception involves self-consciousness: for the mind cannot become aware of the existence of something besides itself, without perceiving a difference between that something and itself; and the perception of differences presupposes a knowledge of the things which differ. Thus the elephant must have been conscious of his own existence at the same time that he was conscious of the present relation of some external object to his senses. He must have had, for aught we can see, as clear an idea of the *me* and the *not-me* as belong to most men. This is not asserting that the elephant is a philosopher, but only that he possesses the essential groundwork of intelligence.

"But the mental operation already described involves the exercise of other faculties than those of perception and self-consciousness. In distinguishing itself, the percipient subject, from the perceived object, the mind compares the two, and affirms that they are not the same. We have here comparison and judgment, the prime elements of all reasoning. However complicated any train of thought, it is capable of being resolved into a succession of simple acts of comparison and judgment. It is this fact which leads so many to deny to brutes the possession of these two allied faculties. The course of reasoning adopted is something like the following. One of the faculties of the human mind is the faculty of relations, or the power of comparing and judging. To the exercise of this power are to be ascribed all the grandest achievements of the human intellect, such as the discovery of the law of gravitation, and the evolution of the fundamental principles of ethical and metaphysical science. No animal has ever accomplished such results, and therefore the brute creation does not possess this faculty."

"Sorrow for the loss of friends many animals manifest in a striking degree. Examples of this emotion in domestic animals will readily occur to every one. Forbes, in his 'Oriental Memoirs,' tells us that a friend of his having shot a female monkey and carried off the body, forty of the animals soon surrounded his tent, and, making a great noise, gave evidence of an inclination to attack him. On the presentation of his gun, all retired except one, who appeared to be the leader: he stood his ground, chattering furiously. As the man did not fire, the monkey at last came to the door of the tent and began a lamentable moaning, and by the most expressive gestures seemed to beg for the dead body. When it was given him, he took it sorrowfully in his arms and bore it away to his companions.

"Whether brutes sympathize with the happiness and sorrow of others might at first sight seem doubtful; but facts like the following compel us to decide the question in the affirmative. The story is taken by Brougham from an apparently trustworthy French authority. 'A swallow had slipped its foot into the noose of a cord attached to a spout in the Collége des Quatre Nations at Paris, and by endeavoring to escape had drawn the knot tight. Its strength being exhausted in vain attempts to fly, it uttered piteous cries, which assembled a vast flock of other swallows. . . . . They seemed to crowd and consult together for a little while, and then one of them darted at the string and struck at it with his beak as he flew past; and others following in quick succession did the same, striking at the same part, till, after continuing this combined operation for half an hour, they succeeded in severing the cord and freeing their companion. They all continued flocking and hovering till night; only, instead of the tumult and agitation in which they had been at their first assembling, they were chattering as if without any anxiety at all, but conscious of having succeeded.'

"The emotion of satisfaction at success, and the opposite emotion of dejection at failure, as well as that self-satisfied feeling which we call pride or self-esteem, are often exhibited in the actions of domestic animals: it is not necessary to specify instances.

"Although we should hesitate to affirm that there are many animals which have a sense of the ludicrous, yet it can hardly be denied to the ape and monkey tribes, or to parrots.

"Surprise, curiosity, and the enjoyment of the new, all of which may be considered modifications of one and the same feeling, are noticeable in all the higher animals. Dogs meeting for the first time especially exhibit this emotion.

"That birds apparently delight in the brilliant plumage of their mates is an indication that they are capable of enjoying beauty. The fact that brutes do not seem to manifest any appreciation of the sublime cannot be considered as due to any radical defect in their natures, so long as the philosophers make no fundamental distinction between the sublime and the beautiful."

Prof. J. W. Draper, in his Treatise on Physiology, describes the genius of animals in the following eloquent passage, which I transcribe in full:

"Insects form societies for mutual assistance, defence, invasion, emigration, mere pleasure—societies which undoubtedly arise in the experience of passions, such as love and fear. Of these the duration is variable; some last through the larva state only, some are confined to the imago, some are maintained through life. The organization by which their object is accomplished is various, monarchical, republican. The caterpillars of the processionary moths are guided in their march by a leader; the termites obey at once a king and a queen. The lust of power is not alone felt among human monarchs; the queen bee never rests till she has assassinated her rival. All insects of the same kind are not born equal, nor do all pursue the same occupation; some follow a life of leisure, some devote themselves to the profession of arms, some are laborers. When the metropolis of the termites is attacked, the laborers, as non-combatants, retire, but the soldiers come out. The ants, with which we are more familiar, engage in military and filibustering expeditions; they make reconnoissances, set sentinels, march in a definite order, the van alternately falling to the rear; their lines of communication are maintained, and, if necessary, swift couriers are dispatched for re-enforcements. If successful, they not only carry off their enemies' stores, but reduce the vanquished to actual servitude, compelling them to work as slaves. They have notions of property, and though some of them practice cannibalism, they will amuse themselves in more pleasant occupations, tumbling and playing together like kittens or puppies. With a sentiment of strict justice, the wasp who has returned from a successful foray divides his booty among the males, females, and the laborers who have been working in the vespiary; nor is the sentinel, who is doing duty at the door, forgotten. If, through the chances of war or by accident, any one has sustained a grave injury, in some tribes the most devoted sympathy is shown; the ant will carry his wounded friend out of the heat of the fight; in other tribes a more than Roman firmness is displayed: the sufferer is put out of pain by his companion. Expecting an attack, some insects will shut their doors at night, and barricade them within, or, if the danger is continual, will build masked gateways in succession, with interior walls that command them. They are no contemptible engineers. They can construct and maintain roads of great length, with paths branching from them, which, if necessary, they keep mown; they cross streams by throwing themselves into floating bridges, and the damage done to their premises by an invader they show the most singular skill and alacrity in repairing. How many are the contrivances to which insects resort to carry out their purposes! The caterpillar of the cabbage butterfly makes a ladder and goes up it; the geometrical caterpillar lets down a rope, and, for fear of hurting himself, drops a foot at a time. The gossamer spider sends forth a thread fine enough to rise like a balloon, and, floating in the air, descends or rises by winding it up or letting it out. There are other insects which make diving-bells, and go under the water. No bird makes a net, no beast a pitfall; men and insects do both. A gang of sailors will carry a spar by supporting it on alternate sides on their shoulders; a gang of ants will, in like manner, carry a straw or a long worm. There are spiders which show as much dexterity as an Indian in sneaking forward to get in reach of their prey.

"In their domestic economy, how wonderful! Some build their houses of artificial stone, some of pasteboard, which they make. Some cover their rooms with tapestry, some lay carpets of silk on the floor, some hang their doors on silk hinges, so that they shut by their own weight. They make arches, domes, colonnades, staircases. They practice concealment of food."

Dr. Laycock (quoted by Prof. Draper) remarks thus boldly:

"On what structures depend, if not on these cephalic ganglia, all those wonderful instincts which mimic in their operation the arts of man. There is hardly a mechanical pursuit in which insects do not excel. They are excellent weavers, house-builders, architects; they make diving-bells, bore galleries, raise vaults, construct bridges; they line their houses with tapestry, clean them, ventilate them, and close them with admirably-fitted swing doors. They build and store warehouses, construct traps in the greatest variety, hunt skilfully, rob and plunder. They poison, sabre, and stab their enemies. They have social laws, a common language, divisions of labor, and gradations of rank. They maintain armies, go to war, send out scouts, appoint sentinels, carry off prisoners, keep slaves, and tend domestic animals. In short, they are mentally a miniature copy of man."

It is proper here to speak of the "*Darwinian Theory.*"

Darwin has written a work on the "*Origin of Species,*" in which he brings a large number of facts which go to show that all men and all animals, all organic life, have developed from one simple form, into which life was first breathed. He holds that men were formerly monkeys, that monkeys were formerly of a lower order of animals, that cats, dogs, horses, mules, oxen, sheep, &c., all have reached their present condition in the animal world by slow development—from animals below them. He holds that this development takes place through "selection," or "survival of the fittest;" that the best selects the best in each order of life, and thus the children improve on their parents, while the inferior specimens of each race or tribe die out.

In the great struggle for existence which men and plants and animals have to encounter, the best always wins. In this way animals have improved and developed into the measure and the stature of men.

This theory of Darwin is rendered plausible by a large array of startling and suggestive facts. We know by experience that we can, by selection and care, improve or change breeds of animals and birds, such as horses, dogs, and pigeons. We know that we can do the same with plants and flowers. We know that we can do the same with man.

The question now arises—are the facts sufficient to prove the theory? Concerning this many of us must doubt. We know so little of the antiquity of man, so little of the early history of different races, so little, indeed, of human history, so little of the history of the animal world, that it seems to be impossible either to prove or disprove this brilliant generalization.

The investigations of Darwin have at least brought out some very valuable and interesting facts.

Thus we are told that the organic life on the island bears a close resemblance to the organic life on the mainland near it. The luscious peach of our gardens has descended, by the process of selection and development, from the bitter almond of Persia. Our cabbages even grew wild—a dismal weed—on the shores of Europe. The race-horse of England, under the culture and training of modern times, has become a different animal from its ancestors, both in shape and in quality.

Both his "Origin of Species" and his "Variations of Animals and Plants under Domestication" are worthy of careful study by every thinking mind.

HYGIENE,

OR THE

ART OF PRESERVING HEALTH AND PROLONGING LIFE.

POPULAR FALLACIES CONCERNING DIET.

THERE are more fallacies abroad among the people in regard to diet than on almost any other subject of hygiene. These are not confined to the ignorant and uneducated. They are accepted among the most learned and by those in the highest literary and social positions. These errors are due partly to the fact that the subject of food is a very difficult one, and cannot be entirely understood without some study and care.

Most of these errors, however, are the result of the false teachings of writers on health. Alcott, Graham, President Hitchcock—all sincere, honest men, but thoroughly at fault on nearly all their ideas of hygiene—exercised a powerful influence in their day, and the evil effects of their teachings still remain, and work terrible mischief.

I will briefly point out some of the errors that have been taught by these and others, and which are still abroad among the people.

In the *first* place, it is a fallacy to suppose that *people, as a rule, eat too much, and that most of the diseases of the world come from over-feeding.*

The truth is that, among all decent or civilized people, the tendency is directly the reverse. In our country, and especially in our large cities, far more are underfed than overfed. In civilized, hard-working communities, excessive alimentation is the exception, and not the rule. Throughout our land, thousands and thousands die every year from actual starvation. Some of these unfortunates are little children whose parents are too ignorant, or too poor, to give them what is necessary to sustain life But many of them are adults, whom hard poverty, or sad ignorance, has forced into a habit of systematic though undesigned starvation. Day after day their stomach receives less nutriment than the system demands. Day after day the vital powers slowly fade, the strength grows less, the spirits become morbid, and the face wan and dejected. Disease now steps in, attacks and carries by force some important citadel of the body, and death follows. The process is a slow one—sometimes very slow—extending, perhaps, over many years, but it is oftentimes just as sure as it is slow.

As a rule, the savages eat less than the civilized. They may gorge themselves at long intervals, like the Bushmen and Hottentots of South Africa, and the Greenlanders, and Esquimaux; but between these seasons of hideous gluttony many days often intervene. The average quantity of nutriment that most of the barbarous tribes consume is unquestionably less than that of the civilized, who take three regular meals daily. Indeed, most of the wild races lead a very precarious existence in regard to food. They subsist on snails, bugs, clay, insipid or bitter fruit, unsightly worms, and other substances equally abominable, which are neither nutritious nor agreeable.

I say, then, that the civilized eat more than the savage, and that they ought to do so. The reason is clear. They work harder. They use their brains more. Labor of the brain is always accompanied by waste of tissue. It has been estimated, by Professor Houghton, that three hours of brain-work cause as important changes of tissue as a whole day devoted to mere muscular labor.

There are drones, all through society, who do nothing but live on others. There are gluttons and gourmands, all through society, who do nothing but eat and drink. But gluttons and gourmands are exceptions in civilized lands. Many children undoubtedly eat too much and too often; but they almost always break off the habit before reaching adult age.

Even among our rich and luxurious classes, the number of those who injure themselves by over-eating is far less than the number of those who injure themselves by under-eating. Rich and fashionable people use their brains very actively—oftentimes, it must be allowed, in acts of frivolity and dissipation—are usually hard-working men of business, and need more and a greater variety of food than those who do little or nothing, or who live by muscular toil alone.

In the *second* place, *it is a fallacy to suppose that vegetable food is healthier and easier of digestion than animal.*

Comparative anatomy, physiology, experience, our natural appetites, and the history of the world, all show us that man should have a mixed diet—flesh, fish, fruit, and vegetables.

The contrary doctrine is one of the most monstrous errors that ever infested society. It has carried hundreds and thousands to early graves. The popularity of this error, at one time, was partly the result of the popularity of the men who advocated it.

In this country, we love extremes, and roll them as sweet morsels under our tongues. Vegetarianism is an extreme, and therefore Americans cherished it. At the present time it is not practically advocated by any large or influential number; but there are very many who theoretically believe in the heresy, and who think that they do wrong when they eat flesh or fish. Thus they go on all their lives violating their consciences. "Woe unto the man who creates a sin!"

The truth is, that vegetables, potatoes, turnips, carrots, etc., are not only less digestible than fresh beef and mutton, but they are also less nutritious. They linger longer on the stomach, and, being composed mostly of water, give less nutriment to the system. Therefore, many, who cannot digest vegetables at all, can eat and relish and assimilate beefsteak, mutton, lamb, chicken, turkey, etc., without difficulty. Chronic invalids and dyspeptics should, as a rule, eat largely of fresh meat and fish, and very moderately of vegetables.

It is true, however, that vegetables, bread, and fruit, are all necessary, and all should be used under the guidance of experience, and the taste of each individual.

But it must not be forgotten that more *acute* diseases—far more—arise from fruit and vegetables than from flesh and fish. Each individual must, therefore, find out for himself, by his own experience, what he can indulge in, and what he must forego.

Another fallacy, *in regard to diet, is to suppose that the natural appetite is not the best guide as to the quantity and quality of our food.*

It is true that the appetite does sometimes become perverted. It is true that it does become sometimes a symptom of disease. But these cases are exceptional.

Hideous doctrines have been taught on this subject. We have been solemnly told to rise from the table as hungry as when we sat down. We have been told to be always ready for a meal—in other words, to live in a state of perpetual hunger. We have been told to eat those things that we most hate, and to avoid those things that we most love—that to have a longing for any article is the very reason why we should be denied it.

These doctrines are monstrous. They are unworthy of the nineteenth century. They are a libel on the Creator who gave us taste and appetite, in order that we might know what to eat and drink, and gave us also judgment to direct appetite and taste when the system becomes diseased.

Notwithstanding all its liability to perversion, the appetite is, on the whole, a better guide in selecting food, and in measuring its quantity, than all the books on hygiene that have ever been written.

The practice of weighing the food, which was introduced to the world by the example and teachings of Cornaro, the Italian, cannot be too strongly reprobated. It is impossible for the *scales* to tell us how much to eat. The quantity of food that we need depends on the amount of labor that we do, on the nature of the constitution, on our mental moods, and on the quality and variety of the food which is served.

To weigh or measure the food habitually is not only silly, unnecessary, and useless; it is actually a crime. It wastes valuable hours that should be better employed. It makes us miserable, and that fact alone is argument enough against it. It brings on indigestion and all other woes, and therefore prevents us from getting the best advantage of what we eat.

Another common fallacy, in regard to diet, is the theory that one or two kinds of food, at each meal, are more easily digested, and more wholesome, than a large and palatable variety.

Our books on health tell us over and over again that *two articles* at each meal are sufficient, and that we shall be liable to eat more if the table is covered with a generous variety.

My advice is emphatic and clear. Let there be as generous, agreeable, and attractive a variety at each meal as we can afford. Let the limits of that variety be determined by our purses, our tastes, our appetites, and our talent in cooking, and not by the books.

It is possible for nearly every family to have a good variety of food at each meal, or, at least, at the principal meal of the day, without great expense. Cookery is one of the fine arts. It should be made a study. We have good books on cookery at the present time, and every young wife who loves her household, and every young maiden who hopes to have a household to love, should study the best works on this subject, just as they study grammar, arithmetic, and geography in the schools; and, above all, should practise the art *with their own hands* at home.

Genius never made any lady a good cook. The art is acquired by close study and patient practice, by many and repeated failures.

A good cook can make a pleasant and healthful meal out of a few simple articles. A poor cook will make a wretched dinner, even with the whole market at her disposal. I hope to see the day when the art of preparing food will be taught in our schools, like other important branches; when young girls and young wives will go to the cooking-school as they now go to the dancing-hall, and when even ladies of fashion will boast of their bread and their puddings as they now boast of their acquisitions in music and French.

A variety of food is more healthful than one or two kinds, because it is more easily digested. This is a law of Nature. Appetite teaches us to combine sweet with sour, vegetables with meat, dry food with watery, etc.

A meal composed simply of dry Graham bread, or of potatoes, or of fruit even, is far, far less palatable and less digestible than a meal composed of all three varieties at once. Science and experience are here in perfect accord.

If, therefore, we must eat candy, let it either be with or just after our meals. If we must eat sweets in the evening, let us have sour fruit—apples, or lemons, or oranges—at the same time, and we shall be less injured. We should never eat a large quantity, either of sweet or of sour substances, on a perfectly empty stomach.

Still *another common fallacy is, that brain-workers need less nutriment than those who live by their muscles.*

This idea would never have been entertained if people had depended on their own observation and experience. But we have been influenced by false teachings and erroneous theories.

Any one who has attended associations of clergymen, or alumni meetings, or has boarded with students, has had opportunity to see that brain-workers are large eaters, as indeed they should be if they are really hard workers. The *changes of tissue* in the brain, that take place *during study and thought*, are very important and very *rapid, and must be replaced* by abundant food.

The ruling classes in all powerful countries have been liberal feeders. Babylon was a powerful city in its day, and all accounts agree that its inhabitants were given to free and luxurious living. The same was true of Persia, and indeed of all the Oriental powers that successively held sway over that portion of the earth. The ancient Greeks were far from being Grahamites or vegetarians, but availed themselves of the best that their little peninsula could afford.

They were not, however, as extravagant and luxurious as are the civilized nations of the present day; but, on the other hand, they were not as aggressive and powerful in all that becomes a nation as were many other kingdoms of ancient times.

The most powerful nation of antiquity was Rome. It governed 120,000,000 of people, and displayed great skill and gigantic energy in works of internal improvements. Of the manner of life of the Romans we have more direct and authentic testimony than of any other nation of ancient times. No people of any era of the world were so devoted to the pleasures of the table. The countrymen of Cæsar and Pompey, of Livy and Cicero, of Virgil and Augustus, were as vigorous performers at the table as on the field of battle, in the discussions of the forum, or in the realm of poesy.

Not content with the products of their own soil, or the ordinary articles of diet, they ransacked the most distant lands and seas for the rarest specimens of flesh, and fowl, and fruit, and served them up in every combination then known to the culinary art. The descriptions that historians give us of the banquets of the Roman patricians, in the time of the greatest glory of their empire, seem more like mythical tales than realities; and if they were not thoroughly substantiated, would hardly be worthy of credence.

It is true that the systems of cookery of that time were much inferior to our own, and the best methods of preparing ordinary dishes were not as diffused among the masses as among our own population; but the patricians—the ruling order of Roman society—who made Rome what it was among the nations, left no known means untried to make their tables tempting and luxurious.

If now we come down 1,800 years, we find that the dominant classes of the great powers of the earth are, without exception, good feeders. The skilful cooking of the French, and the roast beef and plum-pudding of the English, have long been proverbial.

France and England are confessedly the two great powers of Europe. The better classes among the Germans and Russians are free and easy livers, though they are not, as a rule, as fastidious connoisseurs nor as voracious as the English. The Americans are, unquestionably, the greatest eaters of the civilized world. There may be Greenlanders who consume, at irregular periods, incredible quantities of train-oil and blubber; there may be certain classes in Europe who live perhaps more expensively; but there is no country anywhere, the mass of whose population live as generously as ours.

Our raw material is greater in variety and abundance than that of any other, and we have all the commercial products of other lands. Said Carlyle to Emerson: "The best thing he knew of that country [America] was, that in it a man can have meat for his labor."

So much has been said of the abstemiousness of Socrates, of Cincinnatus at his plough, and of the simplicity and frugality of many other philosophers of ancient and modern times, and so many precepts inculcating temperance and moderation have been handed down from age to age, that few will be readily inclined to accept these statements concerning the liberal diet of those who live by their brains without specific examination. Elaborate statistics cannot be obtained in regard to the personal habits of any considerable number of the brain-workers of history, but biography is sufficiently explicit to warrant the assertion that vegetarians or dietarians (as the term is popularly understood) have been the exceptions and not the rule among them. The common and almost universally received impression, that severe mental activity is inconsistent with free living, and that vegetarians can think harder and longer than flesh-eaters, seems to have derived its plausibility from the following observed facts, which, as we shall see, can be entirely explained on other principles.

First.—Intuition and experience teach us all that two so important organs as the stomach and the brain cannot both be overtasked at once, without injury to the one or the other. It is said that General Elliot, the defender of Gibraltar during that memorable siege, lived for several days on a very little boiled rice.

Sir Isaac Newton fasted for long intervals while he was engaged on his Principia. Most of the great generals of the world have been rigidly abstemious under the pressure of great emergencies. A number of authors could be mentioned, who, during the execution of great life-tasks, have, for the time, starved the body that the mind might, as it were, act independently of its earthly tabernacle. In this respect they but imitate the shrewd merchant, who, on entering upon some unusually great speculation, retrenches his expenses, and withdraws his funds from other directions, until the emergency is over, when perhaps he spends and invests again with still greater freedom than before.

Secondly.—The standard of living has been so much raised under our modern civilization, that the diet of the heroes of the past seems to be very meagre, though they may have been as liberal as the best of their day.

The laborer of our age and country often spreads a more delicate table than the Court of Queen Elizabeth. Not that the worthies of Queen Bess's reign were poorly fed; for their diet was nutritious, but not as agreeably served and varied as ours.

Thirdly.—There have been, and there are still living those among our prominent *littérateurs* who, for a season at least, have been so attracted by the novelty of vegetarianism, and by the views of Alcott and Graham, that they have practically adopted them, and with the usual ardor of first converts, they have loudly proclaimed their experience, and have exhorted others to march unde the same banner.

Among them I may mention the names of the poet Shelley, Lewes, the biographer of Goethe, and Horace Greeley.

But it is observed most of these gradually lose their enthusiasm over the new doctrine, and finally abandon the system altogether. As has already been suggested, those who suddenly change to a vegetarian or very simple mode of diet at first find that they can study harder and perhaps longer than before, for the reason that they eat much less quantity than when they partake of a variety of food.

The stomach has so little to do that the brain is always in working order, and for a time the new convert, especially if he be of a poetic turn, lives in a kind of intellectual heaven.

But in the majority of cases, this ecstatic existence gradually yields to a feeling of depression and weakness, that can only be relieved by an abundant supply of food. If they have sublime faith in the truth of their theories, united to great strength of will, they may persevere in this misguided course until sickness or death close the scene. Such has been the fate of some very able and promising young students in our colleges and professional schools. But the majority, after testing the new doctrines for a few months or years, gradually abandon them, and return to the natural manner of life. The result is, that after all the discussions that have taken place on this subject, the number of consistent vegetarians is exceedingly small. The impression that those who depend on the labor of their brains need less food than mechanics and laborers, is so deeply fixed in the minds of the community, that it is probable that only the most direct and telling statistics will suffice to introduce a new belief.

OBJECTS OF DIGESTION.

The great object of digestion is the formation of chyle; hence, whatever substances yield this fluid in the largest quantity, and of the best quality, will necessarily afford the most nourishment. But the various substances used for food differ greatly in their nutritious and digestive qualities. Some are highly nutritious, and are, nevertheless, difficult of digestion; others, again, pass quickly out of the stomach without supplying much nourishment to the body. Food is introduced into the stomach with the object of being converted into a fluid fitted to become a constituent part of the living body. It might, therefore, naturally be presumed that substances, already of an animal nature, and similar to the structure which they are intended to supply, would be better adapted for this purpose than either herbaceous or farinaceous food; and this is the case, for animal food contains a greater quantity of nutriment in a given bulk than any kind of vegetable aliment. But it is not alone sufficient that substances used for food are capable of being assimilated; their consistence ought to be soft and loose enough to allow them to be easily acted upon by the digestive organs; because the more tender the aliment, and the easier it is divided, the more readily will it be dissolved by the gastric juice, and converted into chyle. On the other hand, hard and close-grained substances are proportionably slow and difficult of digestion. We also see that persons who eat quickly, without properly chewing their food, are often troubled with indigestion, and frequently void fragments of various alimentary substances, which have passed through the intestinal canal in a half digested state. Old people who have lost their teeth, being unable to chew their food sufficiently, suffer in the same manner. The digestibility of food, then, is owing, in a great measure, to the tenderness of its texture and minuteness of division by the teeth. It has been shown, by direct experiments on the living body, that the different kinds of animal food, whether of flesh, fish, fowl, or game, are more or less easily digested, according as their texture and tenderness of fibre render them easy of mastication and solution; these properties in butcher meat depend greatly on the time that has elapsed since the animal was killed, on its age, sex, food, mode of killing, and of cooking.

The kind of food which the animal consumes in its natural state, or on which it is fed artificially for the purpose of fitting it for the table, will considerably modify the character of its flesh. Animals which feed on corn are firmer in their flesh than those eating the herbs; and animals using mountain herbs are firmer and more savory than those feeding on the succulent and watery herbage of plains. Animals which feed on flesh are coarse and heating; and few of them can be used as food without proving injurious to the system. Castration renders all animals fatter, and causes the fat to be better mixed through the fibrous parts, while it improves the quality of the flesh, and makes it more tender. The flesh of the female is also much more delicate than that of the entire male; and it appears to be generally understood, that depriving females of the ovaries (*spaying*) improves the flavor of the flesh. The texture of the muscular fibre is likewise improved by violent exercise; bull-baiting, hunting, and the old German custom of whipping a pig to death, render the flesh more easy of digestion. A teaspoonful of vinegar given to a fowl some time before killing it renders the flesh more tender when intended for immediate use. Wild animals, when young, are easier of digestion than the same species in the domestic state; and the parts principally exercised, as the wings of birds, and the legs of swift animals, are harder and of stronger texture than the rest of the body. The effect of decomposition or incipient putrefaction on fibrous animal food is to render the muscular fibre less hard, and consequently more easy of digestion. Game, after hanging a sufficient length of time, acquires another quality, which no doubt tends to render it more digestible. A pheasant, for example, if used too soon, is comparatively insipid, but if kept a proper length of time acquires a much finer flavor, and this, by gratifying the palate, increases the flow of saliva, while, by sympathy, the stomach is excited, the secretion of gastric juice is augmented, and digestion is consequently promoted. But tainted meat, though easier of digestion, is more heating; high flavored game would be too exciting for an invalid, and too strong for his stomach. Decayed cheese, like tainted game, is stimulating. A little of it, taken after a full meal, excites the stomach, and would be highly improper for an invalid. But of all the means by which the texture of our food is acted upon, and its digestibility modified, cookery is certainly the most important. A few remarks, therefore, upon the principles which render the ordinary culinary processes serviceable in the preparation of our food, may be useful.

DIFFERENT MODES OF PREPARING FOOD.

ROASTING. Flesh, when roasted, and neither too much nor too little done, contains nearly all the juicy parts, and more of the nutritious principles, than boiled meat. Roasting softens the tendinous parts better than boiling, while the crust retains the juice, and gives the gravy a brown color and an agreeable taste; but during the process it is computed that the meat loses about a third of its weight by the melting out of the fat and the evaporation of the water. By roasting, the fibre is not rendered so soft and pulpy as by boiling, and the meat is consequently not so easy of digestion; for the digestibility of food depends in a great measure upon the softness of its texture; but roasted meat is much more nutritive. One pound contains as much nourishment as two of boiled meat. The gelatinous and viscid meats, however, of the younger animals, veal and chicken for example, are more wholesome and easier of digestion when roasted; for, by boiling, the gelatin acquires properties which render it very oppressive to the digestive organs. Many people suppose that underdressed meat is easier of digestion, but this is a mistake, for when not sufficiently done, its texture is more dense.

Boiling. If boiled too long, or too fast, the albuminous part of meat becomes coagulated, and the flesh is rendered hard. The water should not be brought quite to the boiling point, but should be kept long at a temperature a little under it. By this plan of cooking the meat will be found more wholesome, and easier of digestion. Mutton in boiling generally loses about one-fifth, and beef about one-fourth of its original weight. The quality of the water is also of importance; beef or mutton boiled in hard water is more tender and juicy than when soft water is used. Water of this description, or with a considerable quantity of salt in solution, is also best suited for the boiling of fish. Vegetables, on the contrary, require soft or rain water, and care should be taken to have them boiled sufficiently. By neglecting this precaution their digestibility is greatly diminished, and they are rendered injurious. Vegetables, if not well boiled, pass through the alimentary canal without undergoing much alteration; and in some stomachs they ferment and run into acid, causing heart-burn and disorders of the bowels.

Broiling. If the portion of meat is not too thick, and its fibre cut across, the heat quickly penetrates and loosens the texture. From the suddenness of the operation the juices are retained, and it is thus rendered peculiarly tender. There is no kind of cooking more wholesome than this. A well-broiled rump-steak or mutton-chop is juicy and rich, and is by far the most nourishing and the best suited for the stomach. From the nutritive and digestible qualities of meat dressed in this way, broiling is considered the best mode of cooking, where it is thought proper to give animal food to restore the strength of invalids.

Frying. This is the most unwholesome kind of cooking; it should be carefully shunned by invalids.

Baking. By this operation (inferior to roasting) the meat is equally done and tender, but the retention of the oil or fat prevents the easy digestion of baked meat. Baking, however, may be safely employed in the preparation of light puddings for convalescents; but butter should not be used for the purpose of browning the surface of the pudding.

CLASSIFICATION OF FOOD.

The different articles of food have been variously classified.

In this work I shall not attempt to present any formal classification, but shall give merely the ordinary division, which can easily be remembered and understood.

1. *Albuminous substances.*—Under this class are included the *albumen of eggs; fibrin*, found in the blood; *casein*, found in milk;

gluten, found in wheat flour. Albuminous matters can *coagulate, ferment, and putrefy.*

2. *Oleaginous or fatty substances.*—These are found both in animal and in vegetable food.

3. *Starch and sugar.*

4. *Inorganic substances.*—Under this class are included water, lime, common salt, soda, potash, iron, and magnesia. *Our diet should be composed of all these substances.*

Thirteen different substances make up the human body. Our food must contain these substances—*all* of them—in order to supply the waste of tissue that is continually going on.

The average quantity of food required for adults is between *two and three* pounds of solids, and *three or four* pints of liquids. In regard to quantity every one must judge for himself by his own experience. The quantity depends on the *age*, the *sex*, the *constitution*, the *state of the health*, and above all on the amount of *muscular or brain work* that we do. *Appetite is the best guide.*

The *quality* of the food also depends on the *kind* of work that we do. Brain-workers need food that contains a large amount of nutriment, and does not tax too severely the digestive organs. Therefore let them eat fresh meats, fish, eggs, oysters, and bread, and abstain from pork and veal, and use vegetables sparingly.

FLESH FOOD.

Butcher's meat, and all the fleshy or muscular substances used as food, are chiefly composed of *fibrin*, which sustains the same relation to the muscular parts of the animals, that fecula (or starch) does to farinaceous substances. But fibrin is more quickly digested than fecula, and more nutritious. In general the nutritive qualities of the different kinds of animal food are proportioned to the quantity of fibrin which they contain.

The red meats, more especially those which are dark colored, are imbued with a principle called osmazome. This substance is contained in the fibrin, to which it gives a stimulating action, and tends greatly to aid in its assimilation; although of itself it does not appear to possess any nutritive quality. It is to osmazome that the stimulating effects of animal food are attributed; and to this also beef, mutton, and the colored flesh of all animals owe their grateful odor when dressed. It enters sparingly into the composition of young and white meats, which are consequently deficient in savor. Osmazome does not exist to so great an extent in red colored flesh as in that which is dark; and the color of the latter is ascribed to the increased quantity of this principle. These two classes, however, cannot be distinctly separated; they gradually merge into each other.

In arranging the different kinds of animal food according to their nutritive qualities, the flesh of quadrupeds, generally speaking, takes the first rank; next that of birds; then fish; and lastly oysters and other shell-fish.

Beef. Beef affords much nourishment, but being of a firmer texture is not considered so easy of digestion as mutton, though equally nutritious. The flesh of a bullock about the middle age is much superior to that of one which has been worn out with labor, because in all old animals (besides the disadvantage of the greater density of the muscular fibre) the fat is chiefly connected in layers on the outside of the muscles; whereas in young animals it is mixed with the flesh, giving it that marbled appearance which is always expected in good butcher meat. Cow beef is considered inferior in every respect to ox beef.

Beef-tea is much employed for the sick, when the state of the patient admits of animal diet; and, taken with bread, is one of the best restoratives during convalescence, but should be used sparingly, on account of its stimulating properties. Dr. Kitchener, a good authority in such matters, has given the following receipt for making it:—"Cut a pound of lean gravy meat into thin slices, put it into a quart and half a pint of cold water, set it over a gentle fire, where it will become gradually warm; when the scum rises, let it continue simmering gently for about an hour, then strain through a fine sieve, or a napkin, let it stand ten minutes, and then pour off the clear tea." (See *Food for the Sick.*)

Mutton. Mutton in good condition has the proper tendency of fibre to render it easy of digestion. It is not so savory nor so stimulating as beef, but is well known to be very nourishing. The flesh of the *wether* is by far the most digestible, and is considered best about five years old. Ewe mutton is generally preferred about two years old, but is not so savory or sweet.

Pork. Pork is highly nutritive, and is less stimulating than beef; but being the meat most mixed with fat, it remains long upon the stomach. Hence laborers prefer pork and bacon, because, with this food, they are able to remain longer at work without being hungry.

Pork is an article of food that should be eaten only by those who have strong constitutions, and work hard in the open air.

Pork, whether salt or fresh, is hard of digestion, remains for a long time in the stomach, and may be filled with worms—the *trichina spiralis.* (See *Trichina spiralis.*)

Buckle tells us, in his "History of Civilization," that for a number of centuries *pork* was the chief article of diet in Europe. Even at the present day and in our own land, favored as we are with every variety of flesh and fish, of cereals and fruit, yet pork constitutes the principal meat of thousands of families.

The food ought always to be adapted to the constitution and the age. Delicate ladies, the wives and daughters of our farmers, who live indoors, ought not to have the same diet as the farmers themselves who live in the open air. *Farmers, lumbermen, sailors, and soldiers* may preserve health on pork, but brain-workers of all classes, invalids, and delicate ladies and children, should abstain from pork as they would abstain from death. There is not a disease in the whole catalogue which it may not bring on; there is not a pain of which it may not be the father. It is the parent of *dyspepsia, neuralgia, headaches, sleeplessness, "biliousness," constipation, hypochondria*, and every other physical ill.

I am a strong friend of meat, and of fat meat, but I am a bitter enemy of pork for those who live by their brains.

Salted meats in general are less nutritious, less palatable, and less digestible than fresh meats. Ham and bacon are better than other portions of the hog.

If you must eat pork—cannot get hold of anything better—see that it is *thoroughly cooked*, so that the worms in it are all killed. (See *Trichina spiralis*.)

Farmers, mechanics, and laborers may eat *pork* and vegetables with greater freedom. In this country, however, it is eaten by farmers in too great excess. Some are so far away from market that they can get no fresh meat. Let all such keep and kill for their own use plenty of chickens, turkeys, and geese.

The wives and daughters of our country farmers in this country are not on the whole as healthy and strong as the wives and daughters of our city merchants. One reason among others for this fact is, that they are compelled to feed on indigestible pork, and are denied fresh meat. The sturdy master of the house, who is always in the open air, can digest and keep strong on pork and potatoes; but his wife and daughters need a different kind of food.

HARE. The flesh of the hare, like dark-colored flesh in general, is stimulating, and when young and fat, is delicate, and not difficult of digestion. Hares, however, differ much in quality, according to the places where they live. Those that are bred in mountainous countries, from feeding on aromatic herbs, are richer in flavor, and much superior to those inhabiting moist and marshy places. Hare, in whatever manner cooked, especially if made into soup with the blood, is rich and stimulating; and therefore improper for invalids, unless in certain cases, where it may be deemed necessary to administer food of this description.

RABBIT. The flesh of the rabbit is more tender and juicy than that of the hare; but remains longer on the stomach, and is not so nourishing. Wild rabbits are in every respect better than such as are domesticated. The rabbit, like the hare, is in better condition for the table in winter than in summer.

VENISON. The flesh of the *stag*, well known under the name of venison, is not so close-grained as that of beef or mutton; and when not too fat is, to a stomach in full vigor, perhaps the most digestible of all meat; but, like other kinds of game, though very nutritious, is more stimulating than mutton. The fat is esteemed a great delicacy, and highly valued by gluttons.

BIRDS. All kinds of wild birds have their flesh of a looser texture than those that are domesticated, and are therefore easier of digestion, though they are for the most part more stimulating.

The common or *domestic fowl*, although rather slow of digestion, is very mild, and well suited for invalids. *Chicken* is generally the first kind of animal food allowed to the convalescent from fever, and other acute diseases, because it is less stimulating than the flesh of other animals. All white meats, though not so nutritious, are less stimulating than red or dark-colored flesh; and this should never be forgotten in regulating the diet of invalids. For example, a patient recovering from inflammatory disease, though his appetite and the state of his stomach might allow him to digest a beefsteak in shorter time than the wing of a fowl, yet, from the highly nutritive and exciting nature of the former, it could not be indulged in without a great risk of bringing back the inflammation, and endangering the life of the patient.

Turkey yields a similar but stronger nourishment than the barnyard fowl or capon, but partridge and most kinds of game are more digestible.

Geese and *ducks*, from the fat and oily nature of their flesh, are difficult of digestion, and are the most oppressive kinds of poultry. Wild ducks, though very savory, are equally indigestible.

All kinds of animal food cured or prepared with salt, vinegar, or spices, are much more indigestible and heating than in their fresh state, and not so nutritious or wholesome. Both fish and flesh, when dried or smoked, having lost their juices by evaporation, become hard and compact. Their digestion requires much greater labor from the stomach than any other kind of food. With many people, however, a small portion of *ham*, *tongue*, or *bacon* at breakfast, by stimulating the stomach, promotes digestion; with others, again, food of this description remains long on the stomach, and invariably produces irritation. Gelatin exists in the flesh of all the domestic quadrupeds used as food, and constitutes the greater part of young animals; the younger they are the more of this substance they contain, and the less digestible and nutritious is their flesh. Gelatinous substances are not so nutritious nor so easy of digestion as those in which fibrin and albumen predominate. The gelatin contained in the flesh of the sucking pig, in that of birds before they begin to fly, and in all very young animals, presents a glairy or jelly-like appearance. In this state it is neither nutritious nor easy of digestion, and should therefore be avoided by the invalid. The flesh of the calf, of the lamb, and the pig, or that of other young animals, if fed for some time, is firmer, less viscid, and contains more perfect gelatin; hence, it is better adapted for food, but is still far from being so nutritious or easy of digestion as the flesh of the same animals in a state of maturity.

The diminution of fibrin, and the increase of gelatin in the younger animals, are not the only circumstances that distinguish them from those which have attained their full growth. The flesh of the former does not appear to contain (or at least is only provided with a very small proportion of) the stimulating principle, osmazome, which gives the rich flavor to red and dark-colored meats, and which renders them so much more heating than veal, lamb, poultry, and the various kinds of white meat.

VEAL contains a greater proportion of gelatin, and is much more difficult of digestion, than lamb. In order to have good veal, the calf should be fed on the mother's milk until it is six weeks old. The practice of feeding calves on milk adulterated with chalk, or repeatedly bleeding them with the intention of making the meat appear white, cannot be too strongly reprobated. The flesh is deprived of its due proportion of fibrin, and its alimentary properties are greatly depraved.

LAMB. Although it is customary to eat this meat when very young, yet it is not so wholesome as when the lamb has been allowed to suck until it is six months old. The flesh is then of a firmer consistence, fatter, more nutritive, and in every respect superior to that of the lamb killed at two months old.

Chicken, the young rabbit, pheasant, and nearly all the young animals used at table, in which the flesh is soft and tender, without being viscid or glairy, are the most digestible and wholesome of gelatinous food. Albumen is more or less easy of digestion, according to the state in which it is used. When slightly coagulated, it is *easily* digested; not coagulated, it is *less* so; and if taken in a solid state, it is *very* indigestible. But although the digestibility of the albuminous substances commonly employed as aliment is greatly modified by the degree of heat and mode of cooking, yet they are considered very nutritious. The articles of food in which albumen predominates are eggs, oysters, mussels, cockles, the brain, liver, and sweetbread of various animals which give suck to their young.

EGGS. Eggs are composed almost entirely of albumen. The yolk, besides this substance, contains gelatin, oil, and water, in combination with yellow coloring matter. There is also a little sulphur mixed with the albumen. Hence silver spoons used in eating eggs are stained. Raw eggs pass quickly out of the stomach, and produce a gently laxative effect. When taken in this state they are said to be serviceable in jaundice and obstructions of the liver. When boiled in the usual manner they afford a mild strengthening aliment, not difficult of digestion. Hard boiled eggs remain long on the stomach, and are apt to constipate the bowels. They are rendered easier of digestion when used with vinegar as a condiment. The eggs of the granivorous fowls are considered the best; those of the common hen and the guinea hen are most esteemed. The eggs of ducks, geese, and of all the water fowls, contain a greater proportion of oil, and are more strongly flavored; they are only suited for vigorous stomachs.

An egg, boiled until the greater part of the white is slightly thickened, without depriving the yolk of its fluidity, and taken with a due proportion of bread, is excellent for a child, or a person in a state of convalescence; but when the stomach is deranged, eggs, in whatever state, are apt to increase the disorder.

OYSTERS are very nutritive, easily digested, and agree with the stomachs of most people. They are well adapted for convalescents, and may be taken even by those affected with chronic disorders, unless where it is necessary to reduce the patient. They are often resorted to by persons affected with indigestion, being found less distressing to the stomach than any other kind of food. Boiling coagulates the albumen of which oysters are chiefly composed, thus rendering them harder and less easy of digestion; not nearly so many should be eaten when boiled as in a raw state. Oysters cast their spawn in the month of May, after which they are sickly and unfit for food; but in July they recover, and are brought to market in August, when they are considered in perfection.

MUSSELS are of a more solid texture than oysters, and are not so easily digested. The eruption on the skin called nettlerash is said to occur more frequently after eating mussels than any other kind of shell fish. COCKLES, PRAWNS, and SHRIMPS are more wholesome, but should only be slightly boiled. LOBSTERS and CRABS are certainly nutritive, but they remain long, even on the strongest stomachs; their digestion, however, is greatly aided by the use of vinegar.

The BRAIN of the sheep, and the SWEETBREAD of the calf, although they contain a large proportion of albumen, combined with fatty or oily matter, yet preserve their softness when cooked, are easily digested, and very nourishing. The LIVER is also a strengthening food; but is much harder, and more difficult of digestion.

FISH.

Fish are less nutritive than land animals, but afford more nourishment than vegetables. From their great variety they present every degree of digestibility. Fish may be divided into two classes, the fat or oily, and those without fat; but these classes cannot be distinctly separated.

In the *first class* may be placed the herring, mackerel, salmon, eel, the trout, and carp in certain seasons, and to these we may add the turtle; all of which, and indeed every kind of oily or fat fish, are nutritive, but more or less difficult of digestion, and consequently improper for valetudinarians. To the *second class* belong the whiting, haddock, cod, ling, turbot, sole, flounder, and the trout and carp when not fat. All fish of this description, if plainly cooked, and taken without much butter, are more congenial to the stomach, and more easily converted into wholesome nourishment than the former.

WHITING. The whiting is very tender and delicate. It is not very nutritive, but produces no stimulating action on the system. Not being oily or viscid it is easily digested, and therefore well suited to delicate stomachs, and to patients laboring under various complaints, in which the daily use of even the least exciting meat might prove injurious. Physicians know the advantage of varying the diet of invalids, and of those convalescent from acute diseases; and hence, when the use of the mildest animal food is admissible, they frequently order whiting and chicken to be taken at dinner on alternate days, followed by a little sago pudding, or some other mild article of farinaceous aliment.

HADDOCK. In respect to its nutritive qualities, haddock compares with the full-grown barn-yard fowl; and is, perhaps, equally digestible, though not so nutritious.

Cod. Cod contains more gelatinous matter, and is rather richer and heavier than haddock; but is an excellent and wholesome fish. The glutinous parts about the head of the cod should be avoided by invalids.

Salmon. Salmon is a more nutritive fish than any of those mentioned before; but being rich and oily, it is by no means easily digested, and requires condiments, the best of which are salt and vinegar. The thinnest part of the fish is the fattest. Salmon is cleaned and boiled as soon as caught, and served up cold, and thus is comparatively easy of digestion, when taken with vinegar and pepper. Salmon is less oppressive to the stomach, and more wholesome, when used in its freshest state; and, as in the greater part of fish when in perfection, there is a deposition of a curdy-looking substance between its layers or flakes.

Salmon Trout. This fish is not so heating as salmon, and, being less rich and oily, is not so nutritious, but is more under the command of the stomach. All the varieties of trout, though they contain more or less oil, are easier of digestion than salmon; but, like the latter, they uniformly disagree with some persons whose stomachs are not particularly feeble.

The great proportion of fat or oil contained in the HERRING, the MACKEREL, and more especially in the EEL, imparts a degree of richness that renders them very palatable, but with which few stomachs, unless in perfect vigor, are able to contend. The oily matter contained in fish is much more difficult of digestion than the fat of meat. The green fat of the turtle, however, when properly prepared, and not scorched in cooking, is for the most part congenial even to the most delicate stomach; is very nutritious, and easy of digestion. In the West Indies, turtle soup, moderately seasoned, agrees better with patients laboring under chronic dysentery, than other kinds of food.

Perch and many of the fresh-water fish are more digestible than the generality of sea fish; and those caught in rivers and brooks, than others found in stagnant waters. Eels which inhabit ponds and stagnant pools are tough, and not nearly so digestible and wholesome as the silver eel of rapid streams; and the latter soon becomes inferior in every respect, if placed in marshes or dark muddy waters.

The above remarks are sufficient to enable the invalid to judge of the qualities of fish appropriate to the delicate stomach, and to show him the necessity of abstaining from the more oily varieties, and such as are not quite fresh. Rigidity and firmness of texture are the best indications that fish has not begun to spoil.

Fish are not adapted to scrofulous cases, and would be improper when we are desirous of giving tone and vigor to the system.

The best mode of cooking fish for invalids is simply boiling them, or, if perfectly fresh, they may be broiled; but frying is the worst method for a stomach out of order.

PHOSPHORUS IN FISH AND PHOSPHORUS IN THE BRAIN.

A great deal has been said of late about *Phosphorus in the Brain*, and it has been claimed, on the authority of Prof. Agassiz, that those who eat fish are more intellectual than those who do not.

On this subject, the American people, true to their nature, have gone to extremes.

It is true that fish contains phosphorus. It is true that the brain in health contains more or less phosphorus. It is true also that fish is very good food for the brain.

But on the other hand, it is true that meat contains about as much phosphorus as fish. It is also true that meat contains more of the solid constituents and less of water than fish. It is furthermore true that experience has shown that the question of diet and its effect on the brain is a very complicated one, and cannot be so summarily disposed of by an opinion.

It is certainly not true that *the greatest fish-eaters of the world are the most intellectual.**

Phosphorus is not the only food that the brain requires. The percentage of phosphorus in the brain, though very important indeed, is yet small, and is far outweighed by other substances.

Phosphorus is also contained in the husks or bran of wheat, and in fact in all nitrogenous alimentary substances.

There is danger at the present time of making our food too much a matter of chemistry. The natural appetite is our best chemical adviser in matters of diet, at least until the chemistry of the body becomes better understood.

FAT AND OILY FOOD.

This is the least digestible of all the classes of aliment. If used in considerably quantity for any length of time, it is deposited in the cellular structure which binds the muscles together, and consequently augments the bulk of the body without enlarging or increasing the strength of the muscular fibres. Oil or fat, if taken in moderate quantity, and well mixed with other food, is not generally indigestible. Oil, for example, is commonly understood to render salad easier of digestion, and appears to prevent raw vegetable substances from fermenting in the stomach, and causing flatulence.

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* The greatest fish-eating nations of the world are the Japanese, the New Zealanders, the inhabitants of the North of Europe, and the Esquimaux. *None of these nations can boast of much intellect.*

Young people usually have a natural dislike to fat food, and it almost invariably disagrees with them. The antipathy which the stomachs, both of the young and the aged, have to fatty substances demonstrates the impropriety of using them in their diet. (For exception to this rule, see *Consumption.*) A very distinguished American physician, Dr. Beaumont, ascertained that meat containing much fat, and all oily substances, caused a flow of bile into the stomach; and it is well known that persons of a bilious habit are for the most part unable to digest pork, ducks, goose, and other fat meats; when in a liquid state, as in fat broths or gravy, it is still more objectionable. Oily and fat substances, if taken while hot, are less digestible, and more apt to disorder the stomach than if eaten when cold.

Olive Oil. The finest olive oil seldom offends the stomach. Before reaching the United States it always becomes more or less rancid, and never has the delicious flávor of the pure oil used at table in the countries which yield the olive. This oil, when in perfection, is tolerated by the delicate stomach, even when unaccustomed to it, where the mischievous effects of melted butter would not fail to be experienced.

Butter, in the operation of melting, acquires properties which almost invariably render it injurious to persons subject to disorders of the digestive organs.

Almonds, walnuts, filberts, &c., chiefly composed of fecula and oil, are proverbially indigestible.

CASEOUS OR CHEESY FOOD.

Milk. The nutritive properties of milk hold a middle rank between vegetable and animal food. It is strengthening, nutritive, and easily assimilated. It is mild, soothing, and, instead of exciting the system and quickening the pulse (like beef-tea or other preparations of animal food), has a tendency to produce languor and disinclination for exercise. The milk of different animals differs in its composition and nourishing qualities, and it varies according to the food on which the animal has been fed.

Cow's Milk. Cow's milk, being the most plentifully furnished, is one of the greatest importance as an article of diet. In its pure state, it is only adapted for strong stomachs; but in cases where we wish to supply the system quickly with much nutritive matter in small bulk, it is one of the best aliments. It should not be taken by persons laboring under indigestion, nor by those with weak stomachs. Under such circumstances it is very apt to turn acid on the stomach. To prevent this effect, a small quantity of *lime water* often proves a useful addition. In all acute diseases milk should be prohibited, and, if taken undiluted, it is not well suited for the convalescent.

The albuminous part of milk is not coagulated into a mass by boiling like the white of an egg; this is owing to the greater quantity of water with which it is united. By the action of heat a thin film rises to the surface. By skimming this from time to time, the whole of the albumen may be removed. By this process milk is rendered less nutritive, but more digestible, and is, therefore, better adapted to weak stomachs than if taken in a pure state.

Asses' Milk is not so rich in cream and cheesy matter as that of the cow or goat, but contains more sugar, and is much easier of digestion, being eminently adapted to patients whose digestive organs are in a debilitated condition. In many instances it proves gently laxative, and in this respect differs from that of the cow, which, in most cases, has rather an opposite tendency. To persons threatened with consumption, and in the early stages of that disease, more especially when associated with a deranged state of the stomach and bowels, the milk of asses, when it can be procured in sufficient quantity, is of the greatest service.

Goat's Milk. The milk of the goat is richer and stronger than that of the cow, but does not contain so much sugar. It is easier of digestion to many stomachs than the milk of the cow.

Curd. The curd or albuminous part of milk is separated from the whey by acid, alcohol, and other substances, but the best coagulating agent is the gastric juice. "The infusion of a piece of calf's stomach (*rennet*) not larger than a half-dollar, will coagulate a quantity of milk sufficient for making a cheese of sixty pounds' weight, although the quantity of coagulating matter cannot in this case exceed a few grains"

Milk coagulates upon all stomachs, and the curd thus formed is soft and loose; but when prepared out of the body, it often disagrees with the digestive organs, and often oppresses the stomach.

Whey. When milk is coagulated by the addition of a small piece of rennet, the whey, when separated from the curd, contains some butter and curd in solution. It also holds in solution nearly all the sugar of the milk, and is, therefore, more liable than milk to ferment in weak stomachs, and produce flatulence. The whey from mare's milk contains a greater quantity of sugar than that from any other animal. Whey is not so nutritious as milk, but affords an excellent demulcent drink in consumption, coughs, jaundice, dysentery, and other diseases.

CREAM. Cream is more easily digested than butter, and when mixed with tea or coffee not only render these beverages more palatable, but corrects their stimulating principle.

Cream and Fat Meat in Consumption.—Of late years consumption has been treated by cod-liver oil, *cream*, and fat meat, and with good success. Some patients cannot take cod-liver oil; it is too nauseating. Such patients are often benefited by *cream* and *fat meat.*

It is a very interesting and *suggestive fact, that patients who are consumptive, or are inclined that way, have an aversion of a most positive character to fat meat.* This is a subject to which I have given much attention. I have made inquiries of my patients to a considerable extent, and have found that the majority of consumptives have a positive aversion to the fat of meat, and that they usually cut it off on the plate. Such patients should try and learn to use fat fresh beef, by eating a very little at a time, with other food.

Cod-liver oil seems, in a measure, to take the place of fat.

BUTTER. Butter, like other animal oils, unless very sparingly employed, is not congenial to weak or delicate stomachs, or to persons of bilious temperament; but taken in moderation, when fresh and good, it agrees with any age or constitution. When slightly affected by heat it is very oppressive to the stomach, and often produces heartburn. Persons of delicate constitution, or those affected with indigestion, should, therefore, avoid eating any food fried with butter.

CHEESE. It is a strong and nourishing food to those who can digest it, but is only adapted to robust constitutions and to those who take much exercise. It is almost invariably hurtful to persons whose digestive organs are weak.

Toasted cheese is particularly injurious to the delicate stomach.

FARINACEOUS FOOD.

The base of all the substances of this class is a distinct principle, possessed of peculiar properties, named *fecula*, or starch. This is the most widely diffused principle of the vegetable kingdom, and is met with in various parts of plants, in the seeds, roots, pith, or leaves; and appears intended by nature to be the chief food of mankind. Fecula, however, is never used in its pure state; it is always associated with different substances, such as gluten, sugar, albumen, mucilage, &c.

The elementary principles of fecula and gum are the same, yet they differ widely in their chemical properties and nutritive qualities. Fecula exists in the various farinaceous substances in the form of numerous globules or grains, more or less round or elongated, each formed of a succession of concentric layers, one within another, like the coats of an onion, having the same elementary composition, but varying in their physical qualities; the external coats being endowed with a much greater power of resisting the action of the agents capable of modifying the fecula. Hence, the stomach has very little influence in changing the formation of fecula in its organized condition, and it cannot be considered as actually nutritive until submitted to the action of heat. Whatever mode of cookery is adopted, the heat produces the effect of bursting all the grains, and thus renders fecula one of the most easily digested substances, although completely useless as an article of diet until this physical change be effected.

SWEET POTATO. It is very nutritious, and when simply roasted or boiled, forms a very palatable and wholesome food. As it does not appear to be so easy of digestion as the common potato, it should be eaten more sparingly by those who have weak stomachs.

Yam. This root very much resembles the sweet potato in its properties. It forms a very extensive article of food in the West Indies, and is very nutritious. It is sometimes ground into flour and made into bread.

WHEAT. The most important of all farinaceous substances is wheat, which, besides fecula, contains a large quantity of gluten; and hence of all the grains wheat is the best adapted for making bread. Animals do not live for any length of time when fed on gelatin, fibrin, or albumen singly; in general, they cause such disgust that the animals prefer dying rather than taking them. Gluten, or the adhesive part of wheat, will, on the contrary, nourish an animal well, and for a long time. The flour or meal of other farinaceous seeds does not contain a sufficient quantity of gluten to allow it to undergo what has been called the *panary fermentation*, and cannot, therefore, be made into loaves like the flour of wheat.

INDIAN CORN. The meal made from Indian corn furnishes a most wholesome and nourishing food, well adapted for the support of the active and laborious class. Indian bread, when properly prepared, were it not for habit and fashion, would be preferred to bread made from wheat, both on account of its agreeable flavor and delicious taste. In the Southern and New England States it is prepared in a great variety of ways, and is a most excellent article of food.

Bread. Bread differs widely from the flour of which it is composed, and may be considered as a new substance. It is easier of digestion than any other preparation of flour, and mixes more readily with water, but is considered less nutritive. Newly baked bread, however, swells in the stomach, and is not easily digested. Indeed, the process of fermentation does not appear to be completed until the bread is cold; for new-bread differs from old not only in its effects, but in smell and taste. "The best bread," says Dr. Coghan, "is made of pure flour of good wheat, sufficiently leavened, somewhat salted, well moulded, well baked, and at least a day and a night old, and not past four or five days old, except the loaves be very great." Besides the nutritive qualities of bread, it prevents the bad effects which would result from the use of too much animal diet, rich soup, and other concentrated food. It also serves to divide and give our aliment a proper bulk and consistence. It may be allowed to the stomach of the weakest patient. It neither stimulates nor relaxes the system, and is justly called the staff of life.

There are three sorts of bread, the white, the wheaten, and the household. Fine white bread is made of flour only; wheaten bread, of flour mixed with the finer bran; and household bread of the whole substance of the grain, including the coarser bran. Fine white bread is the best, and to most people is more agreeable to the palate than any other kind of bread, being entirely deprived of the bran; but it is not so nourishing. The common coarse bread, which contains a considerable quantity of bran, is much more nutritious than white bread; so much so that dogs fed on the former have remained in health, whereas those fed on white bread have gradually wasted away and died. This difference, it appears, arises entirely from the absence of the bran. From the mechanical action of the particles of bran upon the lining membrane of the bowels, the household bread acts on many persons as a gentle laxative. The white bread, on the contrary, has a tendency to constipate the bowels, because the astringent action of the starch which it contains is not counteracted by the bran.

BREAD-MAKING.

Aërated Bread.—This is made by mixing the dough with water and *carbonic acid.* This kind of bread is made in large manufactories erected on purpose. It cannot well be made in a private family. The bread made in this way is quite palatable, and is easier of digestion than ordinary fermented bread. When *toasted* it is excellent.

Prof. Horsford's Process.—Prof. Horsford, of Harvard College, has devised and popularized a method of bread-making by the use of *phosphate of lime* and *bi-carbonate of soda*, so as to form neutral phosphate of lime and phosphate of soda, carbonic acid being evolved.

The advantages of this process are:

1. It supplies phosphorus to the bread, of which it is deprived by sifting.

2. It is easily made, is baked in half an hour, and is palatable.

Fermented bread is usually *less* digestible when hot than bread which is raised by these other processes.

Heavy, soggy bread, hot or cold, should never be eaten except by those who are in imminent peril of starvation.

Various articles are used in the adulteration of bread; the most innocent of them is the potato. Alum is much employed to give whiteness to bread, and to prevent the loaves from sticking to each other in the oven. The daily introduction of small quantities of alum into the stomach must interfere in some degree with the exercise of its functions, and to those troubled with indigestion it must prove highly injurious. Persons affected with stomach complaints should, therefore, be careful to get their bread made without alum. The carbonate of ammonia (sal volatile) is extensively used instead of yeast in making the finer kinds of bread; but it does no harm, and is rather advantageous than otherwise.

There is phosphorus in the bran of wheat. This fact is worthy of consideration by those who live entirely on white bread.

There is, however, danger of going to an extreme in the matter of bran bread. *Those who do not like it should not as a rule eat it.*

This subject I have discussed and explained more fully under "*Constipation.*" *Those whose stomachs are very weak and sensitive, and liable to acidity, oftentimes* cannot digest easily bran or Graham bread.

Indian meal or corn bread—including, of course, the luscious johnny-cakes—is in some respects more nutritious than white wheat bread, and should be used by those who love it and can digest it.

Pastry is not so injurious as is commonly supposed, provided the crust is *light and flaky. Soggy pie-crust is a crime. But yet pastry and cakes should not be eaten largely, and never should constitute, as they too often do, especially in country places, the chief part of a meal.*

BUCKWHEAT CAKES. In the United States, *buckwheat cakes* are a staple article, especially in cold weather. In Europe they are little known.

When they are well made they are healthful. To be well made they should be light, crisp, and sweet. In cold weather they are eaten freely with sugar, butter, molasses, syrup, and gravy, because at that season of the year we need heat-producing substances. Buckwheat is not as nutritious as wheat or corn, but it helps our variety of food, is very palatable and easy of digestion, and therefore should be encouraged. *Buckwheat cakes should not be used too exclusively:* other food—wheaten bread, meat, &c.—should be combined with them.

Buckwheat sometimes produces eruptions on the skin, and there are persons to whom it seems to be poisonous.

OATS. Oatmeal, prepared in various ways, constitutes one of the principal articles of diet in Scotland, and in some parts of England, where it is found both wholesome and nutritious. It is, however, inferior to wheaten flour in nutritive qualities. Oats contain a considerable proportion of sugar, and on this account cakes and other preparations of oatmeal are apt to run into fermentation in the stomach; they are also more heating to the system than either wheat or barley.

RICE. Rice contains about eighty-five parts of starch in the hundred, and having no stimulating matter in it to quicken digestion, remains longer on the stomachs of some persons than other farinaceous substances. In India, and other eastern countries, where it constitutes the principal food of the inhabitants, it is usually taken with curry powder, peppers, and other stimulating condiments, in order to assist digestion. Mixed with other food it is wholesome and well adapted for delicate stomachs. Rice-water is an excellent demulcent drink when there is irritation of the bowels, dysentery, or diarrhœa. Ground rice and milk, flavored with orange peel and sweetened, is a valuable article of diet during convalescence. Some of the French authors strongly recommend rice diet for those affected with red gravel.

BARLEY. Barley contains a large proportion of starch, and much saccharine matter. The latter renders it well adapted for distillation. Dr. Coghan quaintly remarks, that "Though barly, as Galen saith, is of a cooling nature, yet it maketh such hot drinke that it setteth men oftentimes in a furie."

RYE. Rye flour contains a greater quantity of gluten than any other kind of flour except that of wheat, and also a considerable proportion of mucilage; when well kneaded it ferments, and partially rises; the bread is of a brown color and not disagreeable to the taste, but is rather slow of digestion; it is also apt to turn acid on the stomach, and to relax the bowels of those unaccustomed to its use. Hence bread made of wheaten and rye flour is found very serviceable to persons who are subject to constipation of the bowels.

This grain yields a black, morbid excrescence, curved like the spur of a fowl, called *ergot of rye*, which is often of the greatest service in the hands of the skilful accoucheur.

POTATOES. Potatoes contain a large proportion of starch, but no gluten; they improve in quality, becoming more farinaceous or mealy from the time they are taken out of the earth until they become waxy, when their nutritive qualities diminish, and they are less easy of digestion. The soluble nutritive matter contained in the potato is not nearly so great in the same bulk as in any of the grains. It has been computed that 2 lbs. of wheat contain as much nourishment as 7 lbs. of potatoes.

Potatoes are easy of digestion only when mealy. Many persons use potatoes with animal food, in preference to bread, and, when not new or waxy, they constitute a very wholesome substitute. They are not considered a suitable article of diet for invalids, particularly for those affected with indigestion. The form of cookery best adapted for potatoes is, boiling in water containing a considerable quantity of salt in solution. When saturated with the fat of roast meat they are suited only for the strongest stomachs. When mashed they are swallowed without being sufficiently mixed with the saliva, and are, consequently, less easy of digestion. When roasted they sometimes agree best with persons whose digestive organs are weak; but this is not generally the case; and when overdone they are insipid, and deprived in a great measure of their nutritious qualities. But, whatever mode of cookery is employed, they should be used as soon as possible after being removed from the fire. The starch of the potato closely resembles arrow-root powder, for which it is very frequently sold. This fraud, however, does no harm, for the one starch is little inferior to the other, and their properties are the same. Potatoes are also extensively employed to adulterate bread, and it would be well if nothing worse were used for this purpose.

Potato is not the most valuable kind of food. Potatoes are largely composed of *water*. According to Pereira it takes 10¼ pounds of potatoes to give us as much nourishment as is contained in *one pound* of beef. *Potato diet, when exclusive, makes potato brains.* Witness the Irish peasantry. Other causes besides their diet operate to depress these people, but the potato must have a portion of the blame. Potatoes should always be used with meat, fish, eggs, and bread, and should never constitute the principal part of the meal. We should study the effects of diet not alone on the muscle, but on the *brain*, on the intellect. The Irish peasantry have strong muscles, but their intellects are dull and hard.

Nothing very great or very good was ever achieved by a nation of potato-eaters or of vegetarians.

PEAS. Peas, when green and young, are watery, and contain little nourishment, but when properly dressed are light and wholesome. When ripe and dried they are used in the form of pudding and in soup. In both ways they are very nutritious, but the former is difficult of digestion, and only suited for the strong laboring classes. The soup, though less objectionable, should be avoided by those troubled with stomach complaints. Peas, when full grown and dry, in whatever manner they may be cooked, are remarkable for their production of flatulence.

BEANS. Beans, when young, possess nearly the same properties as peas. The pod of the kidney bean is a succulent, tender, and much esteemed vegetable, though not very nutritive. The bean itself, when ripe and still tender, is more nutritious, but not so easy of digestion. The dried kidney beans contain eighty-four per cent. of nutritive matter, of which fifty are pure farina, and the rest gluten and mucilage. Hence they are more nutritive than wheat or any other kind of pulse. They are much more wholesome than peas, and are well suited to correct the effects of fat animal food. They agree well with the laboring classes who are accustomed to their use, and they are very fond of them. "In certain parts of Scotland," says Dr. Cullen, "the farm servants would not engage unless their masters stipulated that they were to receive so much meal of this bean by the day or the week."

CHESTNUTS. Chestnuts are composed almost entirely of fecula and sugar, and form one of the principal articles of diet in many countries. If kept for some time after they are gathered, they become sweeter, more mealy, and easier of digestion; but, notwithstanding, they are unsuited to weak stomachs.

ARROW-ROOT. This well-known powder, which consists of pure starch, is obtained from the root of a plant which is a native of the West Indies. Boiled in water it forms a mild nutritious jelly, much used as food for children and invalids. It is prepared in the following manner: A portion of the powder, mixed with a little cold water, is to be made into a paste by rubbing it in a basin with a spoon; over this boiling water is to be poured. It should be stirred briskly at the same time; then boiled five minutes and sweetened with sugar. A little milk and nutmeg may be added, or a small quantity of Sherry or Madeira wine, according to the state of the patient. Port wine does not answer so well because it precipitates the starch. Half an ounce is sufficient to make half a pint of the jelly.

SAGO. Sago is composed of starch, with a little salt and coloring matter. It is derived from the pith of several species of palms. The best is called *pearl sago.* It soon becomes sour if allowed to remain in the form of powder, and is, therefore, made into grains by pressing it through a strong coarse sieve when half baked. Potato starch is easily formed into grains in the same manner, and is often fraudulently sold as sago. The usual way of preparing sago is to put a tablespoonful of the grains into a pint of hot water, and allow it to remain at the side of the fire for two hours; then to boil it for a quarter of an hour, stirring it diligently during the boiling. Sugar and milk, or wine, may be added to it in the same manner as with the arrow-root.

TAPIOCA. Tapioca is the produce of the roots of a plant which grows in great abundance in Brazil and in the West Indies. The roots in their raw state are called *cassada*, and are strong poison, yet the starch extracted from them is similar in its nutritive qualities to sago, which it resembles in appearance, but is not so high-colored, and is formed into larger grains. It is prepared in the same manner, only that it does not require to be macerated, or boiled more than half the time.

SALEP, which is obtained from different kinds of the *orchis*, the species of arrow-root called *Tous les Mois*, and the vegetable extracts above noticed, are all merely varieties of starch, and do not differ in their properties. They are very generally prescribed as diet for the sick, and it is not of the slightest consequence which of them is preferred, unless as a matter of taste. They may be either taken simply boiled in water, or with the addition of milk or wine, according to circumstances.

MUCILAGINOUS FOOD.

Mucilage is a distinct principle abounding in different parts of vegetables, but is never found *alone* in the mucilaginous substances used as food. It is always associated with sugar, or some bitter, acrid, or acid principle, without which it would be indigestible, and almost devoid of nutritive properties. Several of the vegetable substances, usually classed under this head, contain more sugar than mucilage, and in all there is a large quantity of fibrous and coloring matters, which are entirely indigestible. Hence the evacuations from the bowels are more copious after this than from any other kind of aliment. The numerous herbs and roots which belong to this class are more valuable in correcting the effects of stimulating animal food than from their own nutritive properties.

CABBAGE. Red and white cabbage are much relished by many people, but they have a great tendency to ferment in weak stomachs, and are only suited to persons of robust constitutions who take plenty of exercise.

BROCCOLI AND CAULIFLOWER. These are much superior to cabbage, being more tender, easier of digestion, and less apt to produce flatulency.

SPINAGE yields very little nutriment, and is, perhaps, the least nutritious of all the vegetable substances used at table; it passes quickly out of the stomach without being digested, and imparts its green color to the fæces.

LETTUCE. The lettuce is generally used as salad, and is the most tender and delicate of all the vegetables eaten in a raw state. It is cooling, and has a tendency to induce sleep; but, when employed with this intention, it should not be very young, and must be eaten without vinegar. This, as well as all kinds of salad and raw vegetables, is rendered more wholesome by an ample accompaniment of the usual condiments; but, in whatever manner taken, they rarely agree with weak stomachs.

ASPARAGUS. Asparagus is a very wholesome vegetable and is easily digested. It does not create flatulency or acidity, but with some people acts as a diuretic.

ARTICHOKE. Artichokes afford a light and tender food, and are similar in their properties to asparagus.

ESCULENT ROOTS. The principal mucilaginous roots used as food are the carrot, turnip, Jerusalem artichoke, and the large Spanish or Portuguese onion. All the roots of this description are chiefly composed of mucilage, sugar, indigestible fibrous substance, and essential oil.

CARROT. In its wild state it is hot and acrid; but by cultivation it has been greatly changed, and is now a nutritious and wholesome vegetable. It contains a considerable proportion of sugar, and a much larger quantity of fibrous matter. It is not considered quite so easy of digestion as turnip, and in general acts gently as a laxative. Carrots and turnips should be well boiled and eaten when young. The carrot forms an excellent poultice for foul and ill-conditioned sores.

TURNIP. Turnip is considered one of the best vegetables used at table; but is rather flatulent, and requires seasoning.

BEET ROOT. The red beet is more nutritive than any other root except the potato; but it extricates so much gas in the stomach and bowels as to prevent it from being much used as an article of diet. Beet root contains a large proportion of sugar; 14 lbs. yield 1 lb. of sugar.

JERUSALEM ARTICHOKE. This is the root of a species of sunflower, which has obtained the name of artichoke from its similarity in flavor to that vegetable. It is considered a very delicate vegetable; but requires the addition of pepper, salt, or other condiments, to prevent flatulency.

ONION. Onions afford a considerable proportion of nourishment. When boiled they are mild, succulent, and seldom disagree with the stomach. The French introduced the use of onion soup, as a restorative after dancing, sitting up late, or any unusual fatigue; and this practice is now very generally followed in other countries. Sir John Sinclair was of opinion that onions possess more nourishment than perhaps any other vegetable. "It is a well-known fact," says he, "that a Highlander with a few raw onions in his pocket, and a crust of bread or bit of cake, can work or travel to an almost incredible extent for two or three days together, without any other food."

The LEEK, GARLIC, and SHALLOT are similar in their qualities to the onion.

CUCUMBERS are difficult of digestion, and are the most unwholesome of all raw vegetables. "The digestibility of *celery* is greatly increased by maceration in vinegar."

The *stimulating* vegetable substances are *horseradish*, *mustard*, *parsley*, *sauer-kraut*, *pickles*, *spices*, &c. These, and all vegetable productions of this description, employed as condiments to aid digestion, should be taken sparingly by invalids. *Horseradish* is considered the best condiment for the prevention of flatulency.

SACCHARINE OR SWEET FOOD.

"Sugar," says Dr. Prout, "is the only crystallizable product employed in considerable quantity as an aliment; and by the perfectly healthy stomach seems to be readily assimilated. There are, however, certain states of disease in which this organ appears to lose, in a great measure, the power of assimilating this principle; and in such states of disease, sugar, consequently, is ill-adapted as an aliment." Sugar is most abundant in the sugar-cane, in the grape, and fruits in general. The roots which possess the most are the beet, carrot, and parsnip.

SUGAR. As I explained under Physiology, *the starch of our food is converted into sugar during the process of digestion.*

According to Banting, sugar and saccharine food produce *obesity*. Therefore, corpulent and pursy persons who want to reduce their weight should abstain from sugar so far as possible.

He carried out his ideas practically in his person, and with very good success. Others have tried the same system and have seriously injured themselves.

It is said that the negroes of the South become fat during the sugar season.

When sugar is eaten freely in the form of candies, confections, cakes, &c., it should be eaten with or just after our meals—not before meals—and better still, with some acid, like lemonade, sour wine, cider, or fruits.

FIGS, RAISINS, PRUNES, DATES, and other dried fruits, contain a large quantity of sugar and mucilage. To many people they are salutary and easy of digestion. To some they prove gently laxative, and are very serviceable in this respect; but, from the quantity of sugar contained in them, they are very liable to undergo fermentation in the stomach, and to most people are more or less oppressive.

HONEY is very little used as an article of food. It ought never to be taken by the sick and delicate, because it is detained long on the stomach, and frequently causes flatulence and acidity.

ACIDULOUS FOOD.

Under this head are placed the different species of fruit used at table. These are, in general, composed of mucilage, vegetable jelly, sugar, water, malic, acetic, and other acids, and some of them contain a portion of farinaceous matter. They afford less nourishment than any other class of aliment, and are considered more as a luxury than as articles of food. When taken as a dessert, unless used very sparingly, they are particularly injurious to invalids, because they interfere with the full meal which has just preceded them. When ripe, and taken at proper times, they are light, refreshing, and very wholesome. In intertropical countries there is always an abundant supply of various delicious and fragrant fruits, which are both cooling and refreshing, and many of them, containing farinaceous matter with a considerable proportion of sugar, afford nourishment well adapted to the indolent inhabitants of warm climates. In fever and inflammatory disorders (with the exception of dysentery, diarrhœa, and other affections of the alimentary canal) the juicy and watery fruits, such as grapes, oranges, &c., tend to alleviate thirst, are cooling, and very grateful to the patient. In spitting of blood, and other similar complaints, they serve as a valuable auxiliary to more powerful means in lessening the activity of the circulation, and thus moderating or preventing the return of these discharges. The acid fruits, such as lemons and limes, are well known to be specific in scurvy; and the infusion of tamarinds is a useful remedy in vomiting of blood from the stomach.

Owing to certain peculiarities, which we are unable to explain, the stomach is more capricious with respect to fruits than any other article of diet. The stone fruits are considered the least digestible, and the most disposed to fermentation in the stomach. They differ considerably, however, in these respects. Of those in common use, the various kinds of plums, probably, most disagree with the stomach and bowels.

The PEACH, APRICOT, and NECTARINE are the best of the stone fruits; and, when perfectly ripe, seldom disorder the digestive organs. The peach is the most esteemed, and is the easiest of digestion. CHERRIES, even in large quantities, are not so unwholesome as is generally imagined. In various parts of Italy, this fruit, with bread, constitutes the principal food of the lower orders, and agrees well with them, being much better suited to the system, when heated and excited by the warmth of summer, than much animal food.

The STRAWBERRY, RASPBERRY, and GOOSEBERRY are wholesome fruits. APPLES and PEARS are the most nutritious, but as their texture is firmer they require more labor from the stomach, and are, generally speaking, improper for invalids. Pears, being the softest, are more easily digested. The great English physician, Sydenham, allowed no other aliment to his patients, in the febrile stages of small-pox, erysipelas, and quinsy, than *boiled apples.*

The MELON contains more farinaceous matter than any of the fruits previously mentioned. It should never be eaten after dinner without a plenty of pepper and salt, and is altogether improper for persons with weak stomachs.

Of the smaller berries, the *cranberry*, *bilberry*, &c., when baked, are very wholesome, and seldom disagree with the stomach. Indeed, many fruits, otherwise unwholesome, are rendered salutary by cooking, and all fruit pies are excellent articles of diet, if the *soggy* pastry, which is very indigestible, be rejected. *Currants*, *mulberries*, and the more acescent fruits, cannot be tolerated by many stomachs.

CONDIMENTS.

Salt is not only indispensable to man, but appears to be necessary to other animals, many of which, in a wild state, seek for it with the greatest avidity. Abstinence from salt soon occasions disorder of the digestive organs, paleness of the countenance, and emaciation; and unsalted diet almost invariably has the effect of generating worms in the intestines. Bread is rendered more grateful to the palate and easier of digestion by the addition of salt, about twelve to sixteen ounces of which are generally mixed with each bushel of flour.

Vinegar is very serviceable in aiding the digestion of celery, lettuce, beet-root, and other raw vegetables, and in preventing them from inducing flatulence. It is equally useful in promoting the digestion of rich and oily substances, such as salmon. Lemon-juice has a similar effect when used with goose and wild fowl; upon the same principle apple-sauce is, probably from the malic acid which it contains, eaten with pork.

Spices and Aromatics. The various spices and stimulating vegetable condiments should be used sparingly by invalids. They are only wholesome for persons in health, when the stomach has to contend with food known to be difficult of digestion. The habit of using them daily injures the tone of the stomach and impairs the digestive functions. In warm climates, the stimulating action on the stomach of the different species of pepper and aromatics is more particularly requisite; and these, when not used in excess, are in general decidedly beneficial.

ADULTERATIONS OF FOOD.

That food is more or less adulterated, everybody well knows; the extent to which adulteration is carried, very few suspect. In France the laws are so rigid that very many of the articles of food are kept pure; in England and the United States, on the contrary, nearly everything is adulterated. Wherever it will pay, men will adulterate articles of commerce. Food is adulterated in order

1. *To increase its size and weight.*

2. *To enable one dealer to undersell another*, by lessening the expense of manufacture.

3. *To improve its color, or taste, or appearance.* It is for this

purpose that candies are largely adulterated with poisonous colors.

Wheat flour is adulterated with *alum* in order to make it lighter and whiter. Bakers' bread is whiter and lighter than home-made bread, on account of the alum which it contains. *Alum, however, gives it an insipid taste and also makes it less healthful. Bakers bread* is also adulterated with *potatoes and corn or rye meal.* These substances are, of course, harmless.

Cocoa is adulterated with *starch, flour, sugar, oxide of iron, arsenic, and Venetian red.* These latter substances are used to improve its color. Dr. Hoskins, in his excellent work on this subject, says that American cocoa and chocolate are the best in the market.

Butter is adulterated with *water, salt, lard,* and even flour.

Honey is not only adulterated, but is actually *manufactured.* It is made out of *sugar, syrup, water and flavoring extracts, cream of tartar, and alum.* None of these substances are injurious, except *alum.* Manufactured honey is less palatable than natural honey.

Sugar is adulterated with *flour and sand.* The latter article is put into brown sugar to increase its weight.

Spices and condiments are adulterated, especially when they are sold in powder. Dr. Hoskins says that the *insects* which prey upon spices are often ground up with them.

Ginger and pepper are ground up with *roots, flour, insects. Cloves* are adulterated with various barks. *Cayenne pepper* even is mixed with *salt and corn meal and red lead.* Lead may cause that dreadful disease—*lead poison. Mustard* is fearfully adulterated with *flour and turmeric.* The latter is used to restore the color after it has been whitened by adding *flour.* While I was acting as surgeon in the navy during the late war, I found that the mustard that was brought to us was almost tasteless. It consisted very largely of flour. When I wished to make a mustard plaster I found that it was necessary to use a very large amount.

Candy is one mass of adulteration. According to Dr. Hoskins, confectionery is colored by *chromate of lead, gamboge, cochineal dye, bisulphuret of mercury, Antwerp blue, Prussian blue, Brunswick green, verdigris, emerald green, mineral green, Scheele's green, gypsum, whiting, flour, rice.*

The character of most of these substances, especially of the leads, is well known. They are fearfully poisonous, although, like all other poisons, they can be used in moderation without injury, and some of them, it may be, with benefit. *Large quantities* of colored candies are unquestionably injurious, and should not be allowed to children. Let them rather have abundance of *ripe fruit.* If candy must be eaten, let it be taken with our meals or just after, or with some neutralizing acid, like *cider*, sour wine, or lemonade.

Candies are flavored with *fusel oil* and *Prussic acid.* *Colored* confectionery should be banished from our homes.

Vinegar is adulterated with *sulphuric acid.*

Pickles are made of a *salable* green color by letting them "stand for twenty-four hours in copper or brass pans."

Milk, I need not say, is adulterated with *water;* sometimes also, it is said, by other substances, such as *chalk, flour*, &c. Hoskins is of the opinion that these—chalk and flour—are not used, to any extent at least, in the adulteration of milk.

The "slop milk" from the distilleries is unfit for man or beast. "*Slop milk" is adulterated by first adulterating the corn in the distilleries.* This horrible nuisance, once so rife in our cities, has been of late measurably abolished.

For the adulteration of *tea, coffee, fermented and distilled liquors, tobacco, opium*, &c., see "*Stimulants and Narcotics.*"

Drugs and medicines are abominally and criminally adulterated; but this subject is hardly appropriate for a book like the present volume. *Physicians' prescriptions often fail simply because the medicine ordered is adulterated.*

Hoskins, who writes well on this subject, and to whom I am indebted for many facts, speaks thus strongly:

"When we come to examine the list of adulterated articles of food, we are surprised at its extent. Nothing seems to have escaped which is not in its nature insusceptible of vitiation. Bread and butter, tea, coffee, cocoa, sugar, milk, spices, confectionery, preserved fruits and meats, vinegar, pickles, oils, wines and liquors, almost every article which we find upon our tables, bear upon them the trail of the serpent in the form of such delectable substances as salts of copper and arsenic, the chromate, oxide, acetate, and carbonate of lead, bi-sulphuret of mercury, gamboge, chromate of potash, Prussian blue, Brunswick green, catechu, alum, indigo, sulphuric acid, Venetian red, yellow ochre, bronze powders, to say nothing of less injurious, though not less dishonest, additions of plaster of Paris, chalk, starch, burnt peas, beans, rye, and chiccory, water, turmeric, lard, meal, potatoes, &c. All of these articles, and not a few others of the same kind, shall be demonstrated to exist in the food consumed daily by the people of this country.

"The more poisonous substances are usually found in minute, though by no means homœopathic quantities; but this makes them only the more deadly, because it admits of their constant and undetected use, until the constitutions of the victims are fatally undermined. Sometimes, however, immediately serious and even fatal results occur, and we not uncommonly see accounts of the death of children, especially from the use of colored confectionery. How many attacks of 'colic,' 'vomiting,' 'dysentery,' 'sick headaches,' how much nervousness, blindness, deafness, dyspepsia, or even paralysis and insanity, might be traced by rigorous investigation to such sources, it is frightful to think of."

TABLE OF ADULTERATIONS. (*After Hoskins.*)

	ADULTERATIONS FOR BULK AND WEIGHT.	ADULTERATIONS FOR COLOR, TASTE, ETC.
Arrow-root.	Cheaper arrow-roots and starches.	
Brandy (often entirely factitious).	Water, neutral spirits, whiskey, rum.	Burnt sugar, sugar, spirits of nitre, fusel oil, kino and other astringents, acetic acid.
Butter.	Water, lard, salt.	
Bread.	Corn-meal, potatoes, rye-meal.	Alum.
Bottled fruits.		Salts of copper.
Confectionery.	Starch, flour, plaster of Paris.	Cochineal, indigo, Prussian blue, ultramarine, carbonates of copper and lead, red lead and the chromate of lead, or chrome yellow, gamboge, true and false, Brunswick greens (either oxychloride of copper or a mixture of chrome yellow with Prussian blue or indigo), emerald green or arsenite of copper, various ochres (umber, Sienna, etc.), bronze powders.
Coffee.	Chicory, carrot, peas, beans, corn.	Burnt sugar.
Cocoa and chocolate.	Arrow-root, starch, sugar.	Red and brown ferruginous earths.
Cider (often entirely factitious).	Water.	Honey, sugar, tartaric acid, whiskey, alum, burnt sugar.
Cayenne.	Corn-meal, salt.	Red lead, Venetian red.
Ginger.	Corn-meal.	Turmeric.
Gin.	Water, sugar, neutral spirits.	Flavoring substances.
Honey (often entirely factitious).	Sugar, water, glucose.	
Lard.	Water.	Salt.
Mustard.	Wheat flour, corn flour, salt, Cayenne.	Turmeric.

	ADULTERATIONS FOR BULK AND WEIGHT.	ADULTERATIONS FOR COLOR, TASTE, ETC.
Milk.	Water.	Burnt sugar, salt, bi-carb soda.
Pickles.		Salts of copper.
Potted meats and fish.		Bole Armenian. Ven. red.
Rum.	Water.	Burnt sugar and flavoring substances.
Sugar (refined).	Wheat flour.	
Spices.	Flour, dirt, corn-meal, inferior or cheaper spices.	
Tea.	Lie tea, stalks and leaves of other plants.	Black-lead, gum, Prussian blue, gypsum, indigo.
Vinegar.	Water.	Burnt sugar, sulphuric acid.
Whiskey.	Water, neutral spirits.	Spirits nitre, fusel oil, burnt sugar, acetic acid.

WATER. Water enters abundantly into the solids of the body, and is the basis and largest portion of the fluids. It is an essential constituent of all living bodies; and, as it is incessantly expended during life, the waste must necessarily be supplied, to preserve the proper proportion of fluid and solid matter requisite for the due performance of the various functions, and the preservation of health. Water, of all simple drinks, is certainly the best adapted to quench thirst, and impart a due degree of solubility to the food in the stomach. *It should be used freely at our meals, to the full extent of our desires.*

Saunders, in his book on "Mineral Waters," remarks that "Water drinkers are, in general, long livers, are less subject to decay of the faculties, have better teeth, more regular appetites, and less acrid evacuations than those who indulge in a more stimulating diluent for their common drink." But man lives and thrives when habitually using different kinds of drink, which the tastes and customs of civilized life have rendered congenial to him; and there is no necessity for restricting ourselves exclusively to water, unless other beverages are found injurious.

Water should contain as few foreign matters as possible; the difference of its varieties in this respect, according to the sources from which it is obtained, are worthy of some attention.

Rain water is very pure when collected in an open country; but in large towns it is more or less contaminated by the smoky atmosphere through which it falls, and by the impurities lodged on the roofs of the houses from which it drops. When collected from houses it is generally found impregnated with calcareous matter, and should therefore be boiled and strained before it is used.

Spring water is the best adapted for drink when *soft;* it is often oppressive to weak stomachs. It even proves injurious to some of the domestic animals when confined to its use, and is particularly disliked by horses.

River water. River water frequently contains earthy matter in solution, which renders it unwholesome, and in the vicinity of large cities it is more or less contaminated with animal and vegetable substances, which tend still more to impair its salubrity; rest and filtration are therefore requisite before it can be used with safety.

LEAD PIPES.

Water that has stood *over night in lead pipes* of our cities may become poisonous. Persons have been poisoned by drinking *ale* that has stood long in lead pipes. It is well to let the water run a few moments in the morning before using it.

Recently pipes have been made lined with tin.

PURIFYING WATER.

Impure water may be cleansed—

1. By distillation.

Our ocean steamers now distil their water from the sea. The water thus distilled is insipid until by agitation it is made to take up a certain amount of air.

2. By boiling.
3. By filtration through sand.

GENERAL REGULATIONS FOR DIET.

Having briefly noticed the chief articles of food in common use, we shall now proceed to point out a few precautions to be attended to in regulating the diet of the invalid, with some observations on the quantity and quality of his food, the regulation of the periods at which the different meals should be taken, and the bodily and mental exercise which ought to follow them.

MEALS. According to the often repeated saying of Diogenes, the best time for eating is, "for a rich man when he can get an appetite, and for a poor man when he can get food." But we know that habit exercises the greatest influence in regulating the appetite. Persons who are accustomed to breakfasting and dining at certain hours of the day, will always, if in health, feel inclined to eat at those hours; and in many people the desire for food, if not relieved at the usual period, goes off for a time, and indigestion is frequently the consequence. The practice of eating at certain fixed periods is strongly advocated by physicians, as essential to the maintenance of health; and regularity in this respect, besides being in accordance with the proper regulation of domestic economy, allows the food to be entirely digested and the stomach prepared for a fresh supply, before it is charged with another meal. But the number of meals and the times at which they should be taken must depend upon the circumstances connected with each particular case, and must vary according to the age and digestive powers of the individual, the quality of the food, and the amount of exercise taken.

The habit of eating little and often is very properly condemned by all writers on dietetics. By eating frequently we disturb the healthy action of the stomach, and interfere with the natural process of digestion. The stomach follows the general law of the animal economy in requiring rest after labor, and therefore the proper quantity of food should be taken at once, in order that it may be digested, and a few hours of rest allowed before another meal. But this applies only as a general rule; for in many cases of chronic disease, and during convalescence from fever or inflammatory disorders, it would be improper to introduce much food into the stomach at one time. Under such circumstances nature requires that we should administer aliment at short intervals, in order to supply the system with sufficient nourishment without oppressing or irritating the digestive organs.

Some individuals complain of a distressing sensation of depression and languor between meals, and consequently seek relief from frequent refreshment; but this habit is always more or less hurtful, and, like many other artificial wants, requires only a little resolution to be overcome. If perseveringly discontinued for some time, the symptoms in which it originated cease, and the languid and capricious stomach is restored to its healthy tone.

The intervals between meals should not exceed six hours; although such is the power that the system has in accommodating itself to our habits, that many individuals are able to transgress this rule with impunity during many years.

LUNCHES AND DINNER AT NIGHT.

Business men in our large cities are compelled to take *their dinner at night, after the labor of the day is over.*

I do not think that this is so bad a habit as many suppose. Unquestionably the middle of the day is the best time for *dinner* for those who, like farmers, have *quiet leisure* at that time. But business men in our large cities are usually busiest from 11 to 2 o'clock. A hearty meal should not usually be taken when the mind is burdened with *pressing cares and duties. Therefore merchants* in our large cities do well to have dinner *at night*, when their brains are, or ought to be, free from *immediate* cares.

For those who dine at night, ***substantial and agreeable lunches*** are a *duty* and a necessity.

Merchants should give one half-hour, or better still, a full hour, to a substantial lunch, and, if possible, in pleasant company.

BREAKFAST. From the length of time that intervenes between breakfast and the previous meal, it might be presumed that a person in the morning would have a greater appetite for food, and would be able to eat more than at any other period of the day. "This, however," says Dr. Paris, "is not always the fact; the gastric juice may not be secreted in any quantity during sleep, while the muscular energies of the stomach, although invigorated by repose, are not immediately called into action; it is, therefore, advisable to allow an interval to pass before we commence the meal of breakfast." But many persons, from a weakened condition of the system, experience an uneasy sensation of languor, accompanied with a feeling of debility and depression, which unfit them for the ordinary duties of life until they have taken some food.

Breakfast, being the meal which is to support the body during the most active part of the day, should be sufficiently substantial, but no fixed rule can be given with regard to its quantity or quality. These must depend on the constitution and habits of the person, the exercise to be taken, and the time that is to elapse before luncheon. *Liquids are instinctively desired at breakfast to supply the waste by perspiration; for it has been ascertained that a healthy person, in a given space of time, perspires insensibly twice as much during the night as when awake.*

Tea and coffee are the morning beverages generally used, and the choice of these must depend on the experience of each individual of what agrees best with him. Persons affected with indigestion, and those with weak stomachs, are frequently troubled with heartburn, and other uneasy sensations, every time they take much warm fluid with bread and butter, toast, muffins, or meat, especially if fat. In such cases dry toast should be used, and an egg or two, if found to agree with the stomach, should be substituted for meat. Sometimes it is advisable to take a glass of cold water, or a cup of weak tea, on rising in the morning, and only a small cup of tea at breakfast, in order to avoid mixing much liquid with solid food, a combination which rarely agrees well with the enfeebled or delicate stomach.

Where this weakened condition of the digestive powers exists, new bread, spongy rolls, butter, and the fat of meat should be carefully avoided. The lean of cold mutton, or eggs with bread a day old, or plain toast, will probably better agree with the stomach. The adopting of these and similar dietetic measures, according to circumstances, for the purpose of aiding digestion, and restoring the healthy tone of the stomach, is certainly more rational, and more likely to prove successful, than constantly resorting to the use of medicine when the digestive organs are in a deranged condition.

DINNER. Dinner should generally be taken by invalids from four to six hours after breakfast. There can be no doubt that the stomach more easily digests a mass composed of several ingredients than an equal bulk of any one substance. This fact likewise applies to the elementary principles of which the different articles of diet are composed. If only one be taken, in whatever quantity, it affords little nourishment, and is incapable of supporting life for any length of time; whereas, when two or three are combined, the compound substance yields ample nourishment. This fact should not be lost sight of when the stomach is weak. In such cases the meals should consist of several articles; but the principle is only applicable within certain limits.

The working classes, especially in large towns, suffer neither from a variety of dishes nor from dining at late hours; but their digestion is frequently rendered laborious *by eating a full meal hastily*, and returning to their work when the process of digestion is hardly commenced. Among the less robust inhabitants of towns repose is necessary after meals; and eating slowly, in order to allow the food to be properly blended with the saliva, is another observance of no less importance.

TEA. To those who dine late, tea or coffee do not constitute a meal, and should soon follow dinner, as they are intended merely to quicken the action of the stomach, so that the food, already converted into a soft pulpy fluid (chyle), may be diluted, and thereby aided in passing into the blood, in order to be assimilated into the substance of the body.

EATING BEFORE GOING TO BED.

Every day I am asked, Is it well to eat just before going to bed?

Each person must answer this question by his own experience. As a rule, it is not, I think, a necessary habit. In England, however, the custom of "suppers," as they are called, is very common.

It is better to eat some light food before retiring, than go to bed hungry.

Some persons cannot sleep if they retire on a stomach perfectly empty. If we eat during the evening (if we are out at late parties), it is well to select food that is most readily digestible. *Oysters are good evening food*, except where they are fried. *Very hard apples* in large quantities are not good evening food.

Eating in the evening has the effect to make some people *constipated* and sleepless. I need not say to such, *beware*.

EXERCISE BEFORE AND AFTER TAKING FOOD. We are naturally inclined to rest after eating. Active bodily exercise immediately after a meal disturbs the process of digestion. Not only do our own feelings convince us of this, but the fact has been made still more apparent by experiments performed on the lower animals. Sir Busick Harwood, having fed two hungry pointers, allowed one of them to rest in his kennel, the other he kept for two hours in constant exercise. On his return both were killed after the same lapse of time. On opening the dog which had remained quiet, the digestion was found nearly completed, but in the other the digestive process had scarcely commenced. This, however, applies only to active exertion; healthy persons may take gentle exercise after meals without suffering inconvenience; their digestion may be slightly impeded, but will certainly not be prevented. But if the stomach be weak and easily disordered, or a very full meal has been taken, repose is essential to the due performance of the digestive functions. Invalids should, therefore, amuse themselves with light reading or conversation, for an hour or two after dinner. When the digestion is completed, and the chyle has entered into the circulation, we feel invigorated and inclined to bodily exertion. This is the proper time for active exercise, which is then of as much service as at an earlier period; when the food is still on the stomach, it would be injurious. But though the benefit to be derived from exercise, either on foot or on horseback, in promoting the appetite and assisting digestion, cannot be called in question; yet the invalid should never forget that if it be carried to excess, or if he dine without having rested, the functions of digestion are very liable to be deranged.

Eating a full meal in a state of bodily fatigue tends strongly to check the digestive operations. The exhaustion of the nervous energy from long-continued *mental* exertion will also produce the same effects, nor will the stomach be capable of performing its duty if the mind be severely exercised immediately after eating. Most literary men, and persons intently devoted to business, are the greatest sufferers from indigestion; and we should always bear in mind that, when this disorder is kept up by thus deviating from the rules which nature clearly points out as essential to the maintenance of the general health, it frequently gives rise to consumption, or at least is the first symptom of that fatal malady, as well as of many other formidable disorders.

STIMULANTS AND NARCOTICS.

The subject of stimulants and narcotics is of so great and increasing importance that it not only deserves a special chapter, but is in fact worthy of an entire volume.

It is proper and necessary that people everywhere, at least in civilized lands, should understand something of the nature of stimulants and narcotics, in order that they may know how to use them and how not to abuse them.

I may say at the outset, that by stimulants and narcotics I mean not only rum and tobacco, but every substance to which the human race have been accustomed to resort for stimulating and narcotizing effects.

There are as many different kinds of stimulants and narcotics as there are different races and tribes and families of men on the face of the earth.

The following list and explanations, though incomplete, will give some idea of the varieties that are now used in different parts of the world. It will be seen that many of these substances are not known here, even by name.

Fermented and distilled liquors.—Rum, gin, brandy, whiskey, champagne, sweet and sour wines, cider and beer—all contain alcohol, in greater or less quantities. They are used in all civilized and many of the semi-civilized lands, among about 500,000,000 people. In the United States and Great Britain the stronger liquors are used; in France, Germany, Spain, and Italy, the lighter wines.

From Sheen's little treatise I extract the following interesting facts with reference to alcoholic liquors:

"The vine is said to have been introduced into England by the Romans, and vineyards are mentioned in the earliest Saxon charters, as well as gardens and orchards.

"Bede, writing in 731, alluded to vineyards being in existence at that time. Domesday Book also speaks of vineyards in several counties. William of Malmesbury, in his work 'De Pontificibus,' written in 1123, informs us that the vale of Gloucester used to produce as good wine as many of the provinces of France. From the date of the Conquest vineyards appear to have been attached to all the abbeys and monastic institutions in the southern and western parts of the island. But about the time of the Reformation, when the ecclesiastical gardens were either neglected or destroyed, ale, which had been known in England for many centuries, seems to have superseded the use of wine as a general beverage.

"We have no historical record of the period when the distillation of spirits was first known. The Greeks and the Romans were ignorant of ardent spirits, and, from the absence of any evidence to the contrary, we must assume that the art of distilling was not known until long afterwards.

"The use of the still appears to have been well known in the time of Geber, who lived in the seventh century, and who describes very accurately the process of distillation by the alembics—*per descensoriuno et filtruno*—in his work entitled 'Liber Investigationis Magisterii.' It has been stated that Albucasis, who is supposed to have lived in the twelfth century, taught the method of procuring spirit from wine; but as the process of distillation was evidently known long before his time, it is equally certain that his predecessors had submitted fermented liquors to this operation. Arnauld de Villeneuve, a physician of the thirteenth century, is the first author who speaks explicitly of an intoxicating spirit obtained by the distillation of wine, and he considers it to be the universal *panacea*, so long sought after in vain. His disciple, Raymond Lully, was acquainted with spirit of wine (which he called *aqua ardens*), as well as of the mode of depriving it of water by means of some alkali.

"Morewood considers the Chinese to have been acquainted with this process long before the rest of Asia, Africa, and Europe. In his 'Essay on Intoxicating Liquors,' page 107, he says: 'In China, a country which has preserved its civil polity for so many thousand years, the art of distillation was known far beyond the date of any of its authentic records. The period of its introduction into that country, in common with the rise and progress of other chemical arts, is, however, concealed amidst the darkness of ages. But, taking dates as we find them sanctioned by respectable authority, and leaving the assumed antiquity of the nation as a point for the discussion of chronologists, we are certainly led to attribute to the people of this empire the merit of an invention which seems to have eluded the grasp of the human intellect in the rest of Asia, Africa, and Europe, until a more advanced period in the history of the world.'

"The preparation of alcohol may be divided into three stages—the production of a fermented vinous liquor, the preparation from this of an ardent spirit by distillation, and, lastly, rectification or purification. When vegetable substances are placed in contact with air and moisture they undergo that kind of decomposition which is denominated *fermentation.* The products of this process vary at different periods or stages, and on this depends the distinction into kinds or varieties of fermentations. Thus starchy liquids, under some circumstances, become saccharine, the process being termed the *saccharine* fermentation. Sugar, dissolved in water and mixed with nitrogenous matter, is converted into carbonic acid and alcohol, and to this process the name of vinous fermentation is applied. Under some circumstances mannite, lactic acid, and a syrupy mucilage are formed by the action of the nitrogenous or albuminous principles of vegetable juices on the sugar. This change has been denominated the *viscous* or *mucilaginous* fermentation. Vinous liquids are capable of generating acetic acid, and the process is called *acetous* fermentation. Lastly, most vegetable substances are slowly converted into gases, and a substance called vegetable mould, constituting the process termed the *putrefactive* fermentation. The liquid obtained by the vinous fermentation has received different names, according to the substance from which it is obtained.

"When procured from the fresh juices of fruits, as grapes, currants, gooseberries, &c., it is denominated *wine;* from a decoction of malt and hops, *ale* or *beer;* from the expressed juice of apples, *cider;* that of pears, *perry;* and from a mixture of honey and water, *mead.* Fermented infusions of barley (raw grain and malt prepared by distillers for the production of ardent spirits) are technically termed *washes.*

"*Brewing* consists in the process of extracting a saccharine solution from grain, and in converting that solution into a fermented and sound spirituous beverage called beer or ale. This art, although a perfectly chemical one in nearly all its stages, had not until comparatively lately been indebted to chemistry for any of the improvements which have been made in its details. This we may attribute to the rare occurrence in former days of a practical chemist being engaged in the operation of brewing. However, we find that within the last few years very great additions have been made to our knowledge of this art—particularly in our being acquainted with that principle by means of which the conversion of starch into sugar whilst in the mash-tun is brought about. Various other improvements affecting the mode and appliances as well as the principles of the art of brewing have also been adopted by many of our leading firms, which contribute largely to facilitate their means of production and supply.

"The process usually followed by the brewer may be divided into eight distinct parts independent of malting, namely: first, the grinding of the malt; secondly, the operation of mashing; thirdly the boiling; fourthly, the cooling; fifthly, the fermentation; sixthly, the cleansing; seventhly, the racking or vatting; and, eighthly, the fining or clearing. In brewing the various beers, or ale, porter, and stout, three distinct sorts of malt are employed—the pale or amber malt, the brown malt, and the roasted or black malt.

"The first of these alone is used for ales; indeed, for the article so extensively known as pale bitter ale, very light-colored malt only is applicable. The brown malt is the article in general use for giving the flavor to beer, and the roasted malt is chiefly used with the latter sort in imparting the requisite color to porter and stout."

Tobacco.—This is used in the form of smoking, chewing, or snuff-taking more universally than any other stimulant or narcotic—among the civilized, the semi-civilized, and the barbarians—probably among 900,000,000 of the human race.

It is estimated that *four billion pounds* of tobacco are raised annually throughout the world, which is nearly four pounds a year for every man, woman, and child on the face of the earth. Six millions of acres of land are devoted to its cultivation. The history of tobacco is now pretty well known. It is supposed to be indigenous to tropical America. Certainly it was not used in Europe until it was brought there after the discovery of America.

Tobacco received its name from the fact that the plant was first recognized by a Spanish monk in Tabaca, a province of St. Domingo. How long it had been used by the Indians prior to the discovery of America it is impossible to ascertain. Doubtful legends say that the plant was known in Asia many centuries ago, but that it was never smoked or chewed, as at the present day. In 1560 it was reported to the court of Portugal by Nicot, the ambassador of the French, and was introduced from Virginia into England.

It was popularized by the example and influence of Sir Walter Raleigh, and by the close of the sixteenth century it had become quite well known throughout England. Since that time it has extended over a large part of the globe. It was introduced into Turkey and Arabia in the early part of the seventeenth century.

Says Johnston: "In Turkey the pipe is perpetually in the mouth. In India, all classes and both sexes smoke. The Siamese chew moderately, but smoke perpetually. The Burmese, of all ranks, of both sexes, and of all ages, down even to infants of three years old, smoke cigars."

In China the practice is so universal that every female, from the age of eight or nine, wears, as an appendage to her dress, a small silken pocket, to hold tobacco and a pipe.

There is reason for believing that the Chinese knew of tobacco, as they knew of almost everything else, long before the discovery of America.

Opium.—This is used habitually among 400,000,000 inhabitants of the East, just as we use tobacco here. It is estimated that it is indulged in by about 100,000 in the United States. It is certainly used among us much more than formerly. It is, as all know, the juice of the poppy.

Hemp and Haschisch.—These are used in Turkey, India, Persia, Africa, and Brazil, by two or three hundred millions of people.

Hemp appears to have been used in the days of Homer, Herodotus, and Diodorus Siculus. It is raised chiefly in India, Persia, and Arabia. The hemp is a resinous exudation from the plant. It is also raised in Africa and Brazil.

In the plains of India it is consumed in every form, and on the slopes of the Himalayas it is cultivated for smoking as high up as the valleys of Sikkim. In Persia, in the east of Europe, and in Mahommedan countries it is in extensive use. In Northern Africa it is largely employed by the Moors. In central and tropical Africa it is almost everywhere known as a powerful medicine and a desired indulgence. In Southern Africa the Hottentots use it, under the name of dasha, for purposes of intoxication; and when the Bushmen were in London they smoked the dried plant in short pipes, made of the tusks or teeth of animals. And what is astonishing, when we consider the broad seas which intervene, even the native Indians of Brazil know its value, and delight in its use; so that over the hotter parts of the globe generally, wherever the plant develops in abundance its peculiar narcotic principle, its virtues may be said to be known, and more or less extensively made use of.

Effects of Hemp on the System.—"This wide use of the plant implies that the effect of hemp upon the system is generally very agreeable. In India it is spoken of as the increaser of pleasure, the exciter of desire, the cementer of friendship, the laughter-mover, and the causer of the reeling gait—all epithets indicative of its peculiar effects."—*Johnston.*

The effect of hemp, or of *haschisch*, which is prepared from hemp, by boiling the leaves and flowers with water and butter, adding cloves, nutmegs, mace, &c., is said to be very delightful. It obliterates ideas of time, and creates a kind of temporary heaven. These effects, however, vary in different individuals. The word "*assassin*" is said to be derived from the fact, that some individuals under the influence of haschisch are inclined to rave furiously, to threaten, and even to murder. These terrible effects are observed among the Orientals more than among the inhabitants of our own land.

On some persons it causes the most intense anguish for several hours, a sort of double consciousness, and symptoms somewhat similar to the hallucinations of *delirium tremens.*

Coffee.—This familiar drink is used to the extent of about 1,000,000,000 pounds annually.* Like most of our popular stimulants and narcotics, it has come into use chiefly within the past two or three centuries. Like many of the other stimulants and narcotics, it was introduced amid great opposition. Like other stimulants and narcotics also, it has triumphed over all its enemies, and is now used in the best portion of the globe.

"*Arabian Coffee.*—The tree which produces this seed is said to be indigenous to the countries of Enárea and Caffa, in Southern Abyssinia. In these districts the coffee-tree grows like a wild weed over the rocky surface of the country. The roasted seed or bean has also been in use as a beverage in Abyssinia generally from time immemorial, and is at the present day extensively cultivated in that country. In Persia it is known to have been in use as early as the year 875. From Abyssinia it was introduced into Arabia in the beginning of the fifteenth century, when it partly superseded the older chaat, or Abyssinian tea. About the middle of the sixteenth century it began to be used in Constantinople, and in spite of the violent opposition of the priests, became an article of general consumption. In the middle of the seventeenth century (1652), the first coffee-house was opened in London by a Greek named Pasqua; and twenty years after the first was established in Marseilles."—*Johnston.*

The use of coffee was unknown to the Greeks and Romans, and does not appear to have been known in the Asiatic countries as late as the time of the Crusades in the thirteenth century, although its first introduction into Europe was from Arabia. It seems to have been earliest in use in Ethiopia, where it has been drunk by the natives for a great length of time. Mr. Bruce, in his Travels in Abyssinia, states that the Gallæ, a wandering nation of Africa, in their incursions on Abyssinia, being obliged to traverse immense deserts, and wishing to be encumbered with as little baggage as possible, take with them a mixture of coffee and butter rolled up into balls, and carried in a leathern bag. One of these, about the size of a billiard ball, keeps them, they say, in strength and spirits during a day's fatigue.

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* Two hundred millions of pounds are imported to the United States alone.

"Coffee was introduced into Mecca, Medina, and Cairo about the middle of the fifteenth century, and two coffee-houses were opened at Constantinople in 1554. Both at Cairo and in Turkey it had to encounter political and religious opposition. The dervises affirmed that roasted coffee was nothing but a coal, and that the eating of coals was forbidden by the laws of their prophet. So that the coffee-houses were obliged to be shut up until 'a more sensible mufti' succeeded in convincing the people that roasted coffee was not a coal; upon which they were again opened. In later years the use of coffee became extremely prevalent throughout the East. Houses for selling it were established in all parts of the Turkish empire: it was introduced into private families, and the refusal of a husband to supply his wife with coffee was reckoned among the legal causes of a divorce. In Europe coffee was introduced into France and England about a century and a half ago. So rapid was the progress of a taste for it after it became known, that in eight years from its introduction it had become in England a subject of public revenue."—*Bigelow.*

Other Coffees.—"Besides the real Coffea Arabica, other species of the coffee-plant are grown in various countries, and yield a useful marketable bean. Thus, in Silhet and Nepaul the *C. Beuhalensis* is cultivated; on the coast of Mozambique, the C. Mozambicana; on the coast of Zanguebar, the C. Zanguebaria; and in the Mauritius, the C. Mauritiana. The seed of the last of these tastes disagreeably sharp and bitter, and sometimes causes vomiting, yet it is in some places cultivated instead of the Coffea Arabica. It is possible that these so-called different species may, like the varieties of the tea-plant, be only differently modified forms of the same original species."—*Johnston.*

Very many substitutes are used for coffee. One of the best known of these is *chiccory.* It is largely used to adulterate coffee; in moderate quantities is not harmless, but when used to any great extent is decidedly injurious.

"It is a native weed, which, with its large pale-blue flowers, is seen scattered about in numerous places. It has a large white parsnip-like tap-root, which increases in size when the plant is subjected to cultivation. This root abounds in a bitter juice, which has led to its use as a substitute for coffee. The plant is now extensively cultivated for the sake of its root."—*Johnston.*

Chiccory itself is often adulterated. It is almost as hard to find it pure in the shops, as it is to find pure coffee itself. According to Johnston, *Venetian red* is much used to color *chiccory.* Nor is this all; Venetian red is itself adulterated. The manufacturer grinds up his color with *brick-dust*, in order to be able to sell it cheaper and to give it a variety of *colors*.

Tea.—Of the different varieties of tea there are raised annually about 3,000,000,000 *pounds*. It is estimated that three millions of acres of land are devoted to the culture of tea. It is more used than any other form of beverage, except water. It is a product of temperate climes, and seems to be adapted for all countries. It is certainly used among more than half of the human race. Its cultivation, transportation, and sale give employment to millions of men and billions of capital. In New York City alone there are a number of large firms whose yearly transactions in the article of tea are fabulous. Much as it is used in this country and in England, it is used still more freely in China and Russia, where it is drunk several times daily.

Like coffee, tea was not introduced into Europe until the seventeenth century. It is stated that it did not come into general use in China until the year 600, and was introduced into Japan in 810.

The tea-plant is a small evergreen tree or shrub, of the height of six or eight feet. It grows in the valleys, and on the sloping sides of mountains with a southern exposure. In Japan it is planted around the borders of fields, without regard to the kind of soil; while in China, where it is an important article of commerce, whole fields are covered with it, and cultivated with the greatest care.

The origin of the employment of tea as a beverage amongst the Chinese is wrapped in the obscurity which generally belongs to ancient usages; and a fabulous tale is narrated as to its introduction among inhabitants of the empire, whilst, as is usual with fables, it has been imagined to have some allegorical allusion, which, if explained, would satisfy the lover of antiquarian lore. The tale is thus related by one of the compilers of a history of China:

" Darma, a very religious prince, and third son of an Indian king named Kosjusvo, is said to have landed in China in the year 510 of the Christian era. He employed all his care and thought to diffuse throughout the country a knowledge of God and religion; and, being desirous to excite men by his example, imposed on himself privations and mortifications of every kind, living in the open air, and devoting the days and nights to prayer and contemplation. After several years, however, being worn out with fatigue, he fell asleep against his will; and, that he might faithfully observe his oath, which he thought he had violated, he cut off his eyelids and threw them on the ground. Next day, having returned to the same spot, he found them changed into a shrub which had never before been produced. Having eaten some of the leaves of it, he found his spirits exhilarated and his former vigor restored. He recommended this aliment to his disciples and followers. The reputation of tea increased, and after that time it continued to be generally used. Kampfer, in his 'Amænitates Exoticæ,' gives the life with a portrait of this saint, so celebrated in China and Japan. There is seen at the feet of Darma a reed, which indicates that he had traversed the seas and rivers."—*Sigmond on Tea*, p. 12.

Nicolaus Fulpius was about the first medical man who wrote professionally upon tea; but his were not original observations: they were the opinions of the most eminent men which he had collected to give to the world. But in 1678 appeared the first edition of a book, which speedily ran through three large impressions, and had a considerable influence upon the introduction of tea. It was entitled "Cornelio Bontèkoe, Tractaat van het exellenste Kruyd Thee." Although this work was, from the extravagance of its commendations on tea, severely handled by some of the critics, it was translated into many languages, and quoted as the highest authority. He pronounced tea to be the infallible cause of health, and that if mankind could be induced to drink a sufficient quantity of it, the innumerable ills to which man is subject would not only be diminished, but entirely unknown. He thinks that *two hundred cups* daily would not be too much. He is said to have been rewarded for his judgment by the liberality of the Dutch East India Company. Heydentrick Overcamp, who wrote the life of Bontèkoe, states that his inducement to write was to recommend himself to his fellow-citizens, and to defend himself against his colleagues, who did not follow his theory or his practice. Etmüller recommended tea as a fine stomachic, cephalic, and anti-nephritic. Pechline wrote a dialogue on tea, which he entitled "Theophilus Bibaoulus," and several poets indulged themselves in its praise. Petit wrote a poem; Peter Francius, two anacreontics; Heincich, a Doric Melydrion; and our poet-laureate, Tate, joined the melodious bards. Whilst it met with so much approbation there were, likewise, those who were not equally satisfied with its merits. Boerhaave, Van Swieten, and others attempted to stem the tide that was setting in its favor: but they have proved themselves incapable of resisting the general impression, for no beverage that has ever yet been introduced sits so agreeably on the stomach, so refreshes the system, soothes nervous irritation after fatigue, or forms a more grateful repast. It contributes to the sobriety of a nation; it imparts all the charms to society which spring from the enjoyment of conversation, without that excitement which follows upon a fermented drink.

The introduction of tea-drinking into England has been ascribed to Lord Arlington and Lord Orrery, and the year 1666 (the *annus mirabilis* of Dryden) has been assigned as the exact date; but in the diary of Mr. Pepys, Secretary to the Admiralty, the following is registered: "I sent for a cup of tea, a Chinese drink, of which I had never drunk before." In the diary of Henry, Earl of Clarendon, there is a memorandum: "Père Couplet supped with me, and after supper we had tea, which he said was really as good as any he drank in China." The first historical record, however, is an act of Parliament, passed in the year 1660, 12 Carl II. c. 23, which enacts that a duty should be laid of eight pence per gallon on all tea made and sold in coffee-houses; which were visited twice daily by officers, whose duty it was to ascertain what quantity had been made.

Very much has been said and written of the difference between green tea and black tea. The common impression is, that green tea is always poisoned more or less in the preparation. This impression is only partly true. Undoubtedly drugs are sometimes used to color the teas; but in China, in the tea-growing regions, the two varieties are made by difference in the manner of preparation.

Johnston thus describes the processes:

"First, That in the process of drying the leaves are roasted and scorched in such a way as necessarily to bring about many chemical changes within the substance of the leaves themselves. The result of these changes is to produce the varied flavor, odors, and tastes by which different varieties of tea are more or less distinguished.

"Second, That the treatment or mode of handling by which the leaves are converted respectively into green and black teas, is the cause of the different colors of these two main varieties.

"It is by lengthened exposure to the air, therefore, in the process of drying, accompanied, perhaps, by a slight heating and fermentation, that the dark color and distinguishing flavor are given to the black teas of commerce. The oxygen of the atmosphere acts rapidly upon the juices of the leaf during this exposure, and changes chemically the peculiar substances they contain, so as to impart to the entire leaf the dark hue it finally acquires. The precise nature, however, of these changes has not, as yet, been chemically investigated."

"*Maté, or Paraguay tea*, though not used over so large an area as the Chinese tea, is as much the passion of the Brazilians and their neighbors in Southern America, as the latter is of the nations of north-eastern Asia. It is prepared from the dried leaves of Brazilian holly, is said to have been in use among the Indians from time immemorial; has been drunk by all classes in Paraguay since the beginning of the seventeenth century, and is now consumed by 'almost the whole population of South America.' The leaf of this tree is four or five inches long, and after being dried it is rubbed to powder before it is infused. The dried leaf has much of the aroma of some varieties of Chinese tea, and the infusion has a pleasant odor, and an agreeable bitter taste. In the state in which it is commonly used in South America, it is more exciting than China tea, producing a kind of intoxication, and by excessive use leading even to *delirium tremens*."—*Johnston*.

"Some writers have asserted that the tea is roasted upon plates of copper, and that its color is owing to verdigris, with which it thus becomes impregnated. But those travellers who are most entitled to credit affirm that the plates are, without exception, of iron, and Dr. Lettson, after a great number of experiments made with chemical tests, never detected any trace of copper; so that this suspicion appears to be void of foundation."—*Bigelow*.

This Maté is very largely used in the whole of South America. In many respects it is very similar to the tea of China, though much inferior. It acts, however, upon the kidneys and bowels.

A great many substitutes have been used for tea. Johnston gives the names of *twenty-four* of these, and states that many more might be mentioned.

"*Abyssinian Tea*, called in its native country Khat or Chaat, is very extensively cultivated in Shoa and the adjoining regions, and is in general use among the inhabitants, just as tea is in China. It consists of the dried leaves of a species of small tree from which the poorer classes of Chinese prepare an inferior kind of tea. In a light gravelly soil the plant attains a height of twelve feet. The leaves are plucked in the dry season, and well dried in the sun. They are either chewed, boiled in milk, or infused in boiling water, and, by the addition of honey, yield a pleasant beverage. They have much resemblance to Chinese tea, both in their qualities and their effects. They are bitter to the taste, possess exhilarating properties, and dispel sleep if used to excess.

"The leaves of this plant are also used green. Forskäll states that the Arabs eat them green because of their property of preventing sleep. To such a degree do they exhibit this influence, that a man who chews them may stand sentry all night without feeling drowsiness. They are also regarded as an antidote to the plague; and the Arabs believe that the plague cannot appear in places where the tree is cultivated. Botta adds to these qualities that, when fresh, the leaves are very intoxicating."—*Johnston*.

Cocoa.—The different varieties of cocoa are used to the extent of 100,000,000 of pounds annually. It is prepared from seeds. It is sold in the shops in *three* different and familiar forms:—

1. *Rock-cocoa of the stores.*—This is made by roasting the whole cocoa bean, beating it into a paste, and then mixing it with sugar, starch, &c.

2. *Cocoa nibs.*—These are prepared by depriving the bean of the husk and then crushing it. This is the purest form of cocoa.

3. *Chocolate paste.*—This is prepared by shelling the bean, grinding it into a paste, and then mixing it with sugar, cinnamon, vanilla, &c.

There are several varieties of cocoa—the Mexican, Brazilian, and one or two substitutes.

"The Mexican cocoa is the seed of the *Theobroma cacao* (fig. 35). This is a small but beautiful tree, with bright dark green leaves, which is a native of the West Indies and of the central regions of America. It grows spontaneously in Mexico and on the coast of Caraccas, and forms whole forests in Demerara.

"When the Spaniards first established themselves in Mexico, they found a beverage prepared from this seed in common use among the native inhabitants. It was known by the Mexican name of *chocollatl*, and was said to have been in use from time immemorial. It was brought thence to Europe by the Spaniards in 1520, and has since been introduced more or less extensively as a beverage into every civilized country. Linnæus was so fond of it that he gave to the tree the generic name of *Theobroma*—'Food of the Gods.'"—*Johnston.*

Lettuce.—This is a kind of substitute for opium. The juice of the plant somewhat resembles opium. Every one who has eaten lettuce for dinner knows that it will produce drowsiness.

"If the stem of the common lettuce, when it is coming into flower, be wounded with a knife, a milky juice exudes. In the open air this juice gradually assumes a brown colour, and dries into a friable mass. The smell of this dried juice is strongly narcotic, recalling that of opium. It has a slightly pungent taste, but, like opium, leaves a permanent bitter in the mouth. It acts upon the brain after the manner of opium, and induces sleep.

"To this crude extract the name of *Lactucarium* has been given. Like opium, it dissolves in water to the extent of about one-half, and in this soluble portion the narcotic virtue resides. The principal active ingredient is supposed to be a peculiar substance named *lactucarium*, of which the crude contains about one-fourth of its weight. It contains other active ingredients, however, the chemical nature and physiological influence of which have not as yet been rigorously investigated."—*Johnston.*

"Lactucarium is one of those narcotics in which many of us unconsciously indulge. The eater of green lettuce as a salad takes a portion of it in the juice of the leaves he swallows; and many of my readers, after this is pointed out to them, will discover that their heads are not unaffected after indulging copiously in a lettuce salad. Eaten at night, the lettuce causes sleep; eaten during the day, it soothes and calms, and allays the tendency to nervous irritability. And yet the lover of lettuce would take it very much amiss if he were told that he ate his green leaves, partly at least, for the same reason as the Turk or Chinaman takes his whiff from the tiny opium pipe; that, in short, he was little better than an opium eater, and his purveyor than the opium-smugglers on the coast of China."—*Johnston.*

Other substitutes for opium are:

Syrian Rye.—It is used by the Turks.

Bulls' Hoof.—This is used in Jamaica, and has been called the "*Dutchman's laudanum.*"—*Brown*, quoted by *Johnston.*

"*The Hop*, which may now be called the English narcotic, was introduced into this country at a comparatively recent period. It may have been employed in Germany in the times of the Roman writers, but was probably unknown to them. Its use, as an addition to malt liquor, appears to be of German origin. Hop gardens, by the name of *Humolariæ*, are spoken of in documents of the early part of the ninth century, frequently in those of the thirteenth century. In the breweries of the Netherlands, the hop seems to have been introduced about the beginning of the fourteenth century. From the Low Countries, or, as some say, from Artois, which borders upon them, it was brought to England in the reign of Henry VIII., some time after his expedition against Tournay, and about the year 1524. In the twenty-second year of his reign (1530), that monarch, in an order respecting the servants of his household, forbade sulphur and hops to be used by the brewers. Three-quarters of a century later (1603), the introduction of spoilt and adulterated hops was forbidden by James I., under severe penalties. This appears to show that, though considerable attention is known to have been already given to the cultivation of the hop in England, a large part of the hops supplied to the home market was still brought from abroad."—*Johnston.*

Hop is chiefly used in the manufacture of *beer.*

It gives to beer an agreeable bitter taste.

It directly affects the *brain* and nervous system by virtue of its narcotic properties. The well-known soporific effects of beer are caused by the hop used in its manufacture.

Hop also keeps beer from souring, by arresting fermentation.

There are a number of varieties of the hop, which differ very widely in quality.

Hop pillows were once prescribed to King George III. of England, as a remedy for sleeplessness, and since that time they have continued to be used for that purpose.

Whatever effect comes from the hop pillow must be due to the escape of the volatile narcotic principles in exceedingly small quantities.

Coca is a narcotic that is used among 10,000,000 of the human race, chiefly among the South American Indians. It must not be confounded with the beverage *cocoa.*

"It is not less interesting than the narcotics of the East, either in its social or in its physiological relations. It is little known in Europe, its use as an indulgence being in a great measure confined to the native Indians of Bolivia and Peru.

"The *Erythroxylon coca* is a bush which attains the height of six or eight feet, and resembles the black thorn in its small white flowers and bright green leaves. It is a native of the tropical valleys which occur on the eastern slope of the Andes in Bolivia and Peru, and it still grows wild in many parts of these countries."—*Johnston.*

"*Consumption of Coca Leaf.*—We have no accurate data from which to form an estimate of the actual weight of coca leaf collected and consumed in Bolivia and Peru. Pöppig estimates the money value of the yearly produce to be about four and a half millions of Prussian dollars, which, at 1*s.* a pound, the price it yields to the grower, would make the annual produce nearly 15,000,000 lbs. The approximation is sufficient to show us its importance to the higher regions of South America, in an agricultural and commercial, as well as in a social point of view."

"When we consider that eastward from Bolivia and Peru the culture and use of coca have extended into parts of Brazil and to the banks of the Amazon, it will not appear exaggerated if we estimate the actual growth and consumption of the dried coca leaf at 30,000,000 lbs. a year. At 1*s.* a pound, this is worth a million and a half sterling; and at the average produce of 800 lbs. an acre, it implies the use of 37,000 acres of good and carefully cultivated land for the growth of this plant. We may estimate also that the chewing of coca is more or less indulged in among about ten millions of the human race."—*Johnston.*

By the Peruvian Indians *coca* is both smoked and chewed. The leaves, dried in the sun, are the portions of the plant which are used. Of these the Indian will consume daily an ounce, or an ounce and a half.

Its effects at first are pleasant and mild. When used to excess it begets a kind of insanity. In South America, an Indian who becomes a great slave to the use of the *coca* is called a *coquero* —a term meaning the same as our *drunkard.*

The Betel Nut.—This is a narcotic which, though hardly known by name in this country, is yet used among 100,000,000 of the human family.

It is the seed of one of the species of palm. It is cultivated in India, Malabar, Ceylon. It is chewed like tobacco. It is to the Eastern Islands what the *coca* is to South America. Those who use it become most extravagantly fond of it. Like tobacco and opium, it makes them unwilling slaves. When used in moderation its effects are agreeable and exhilarating. Among the wretched poor of India it is an actual substitute for food. Millions of the natives of India would rather be denied their regular meals than their *betel nut.*

" The visible effects of the betel are, that it promotes the flow of the saliva, and lessens the perspiration from the skin. It tinges the saliva red, so that when spit out it falls on the earth like blood. It gives a red color to the mouth, teeth, and lips, which, though at first sight disgusting to Europeans, is by the natives considered ornamental. It imparts also an agreeable odor to the breath, and is supposed to fasten the teeth, cleanse the gums, and cool the mouth. The juice is usually, but not always, swallowed."

" We have no means of estimating the absolute quantity of this nut which is consumed yearly by the Asiatic nations, but it must be very great. It is chewed by probably not less than fifty millions of men ! If we allow to each chewer ten pounds weight a year, which is less than half an ounce a day, this would give the enormous consumption of five hundred millions of pounds weight every year ! Only tobacco, among the narcotics in common use, is used in larger quantity than this. The small quantity of the betel-nut imported into this country is converted into charcoal for tooth-powder, probably from some imaginary idea that it is superior for this purpose to other kinds of charcoal."—*Johnston.*

2. *Chica, or Maize Beer.*—The use of malt beer in Germany, and probably also in England, is very ancient, and that of chica or maize beer in South America appears to be equally remote. It was a common drink of the Indians long before the Spanish conquest.

The usual way of preparing chica is to water or moisten Indian corn, as the English maltster does his barley—to leave it till it sprouts sufficiently, and then to dry it in the sun. It is now maize malt. This malt is crushed, mashed in warm water, and then allowed to stand till fermentation takes place. The liquor is of a dark yellow color, and has an agreeable, slightly bitter, acid taste. It is in universal demand throughout the west coast of South America, and is consumed in vast quantities by the mountain Indians. Scarcely a single hut in the interior is without its jar of the favorite liquor.

In the valley of the Sierra, however, the most highly prized chica is made in a somewhat different manner. "All the members of the family, including such strangers as choose to assist in the operation, seat themselves on the floor in a circle, in the centre of which is a large calabash, surrounded by a heap of dried maize (malt). Each person takes up a handful of the grain and thoroughly chews it. This is deposited in the calabash, and another handful is immediately subjected to the same process, the jaws of the company being kept continually busy until the whole heap of corn is reduced to a mass of pulp. This, with some minor ingredients, is mashed in hot water, and the liquid poured into jars, where it is left to ferment. In a short time it is ready for use. Occasionally, however, the jars are buried in the ground, and allowed to remain there until the liquor acquires, from age, a considerable strength, and powerful intoxicating qualities.

"*Chica* thus prepared is called *chica mascada*, or chewed chica, and is considered far superior to that prepared from maize crushed in the usual manner. The Serrano believes he cannot offer his guest a greater luxury than a draught of old chica mascada, the ingredients of which have been ground between his own teeth."—*Johnston.*

This method of making beer seems hideous enough. But the explanation of the process is quite interesting. The saliva changes the starch into sugar. This sugar afterwards ferments and makes beer.

According to *Von Tchudi*, *chica* can be made from grapes, pineapples, rice, barley, peas, barley, and bread.

"*Palm Wine, or Toddy.*—The sap of many palm-trees is rich in sugar. In some countries this is extracted by boiling down the collected juice, as cane sugar is extracted from the expressed juice of the sugar-cane. In other countries the juice is allowed to ferment, which it does spontaneously, and in hot climates within a very short period of time. This fermentation converts the alcohol and juice which contains it into an intoxicating liquor.

"In the islands of the Indian Archipelago and the Philippines an intoxicating liquor is prepared in this way from the sap of the gomuti palm. It is called *neva* in Sumatra, and the Batavian arrack is distilled from it. The cocoa palm produces the palm wine known in India and the Pacific by the name of toddy."—*Johnston.*

One tree yields from two to six pints of sap or "*toddy.*" After standing a few hours it ferments. When this fermented juice is distilled it makes a powerful brandy. It is said that the palm wine is used by a larger number of the human race than the wine of the grape.

It is used in Chili, South America, in India, and throughout Africa.

The taste of the best qualities is said to be very agreeable, closely resembling champagne.

Sugar-cane Wine, or Guarapo.—This is the fermented sap of the sugar-cane. It receives its name from the fact that it is largely used among the natives of Guarapo.

"*Bouza*, *murma*, or *millet beer*, is a favorite drink of the Crim Tartars. They prepare it from fermented millet-seed, to which they add certain admixtures which render it excessively astringent. They call it *bouza.*"—*Oliphant.*

"The *Arabians*, *Abyssinians*, and many *African* tribes give the same name to a fermented drink which they usually prepare from the seeds of the *Poa Abyssinica.* They occasionally employ millet-seed, however, and even barley, for the purpose. Their bouza is described as a sour, thick drink."—*Johnston.*

This drink is much like our ordinary malt liquors. It is sometimes sucked through a tube, as boys suck cider through a straw.

According to Hooker it is very weak, but in a hot day's march is a very grateful beverage. It is drunk while warm, like our tea and coffee.

"*Quass* or *rye beer*, a favorite Russian drink, is a sharp, acid, often muddy liquor, which, in taste and appearance, resembles some of the varieties of bouza. It is made by mixing rye-flour, and occasionally barley-flour, with water fermenting. It may possibly contain lactic acid, but I am not aware that its composition has yet been made the subject of special chemical inquiry.

"This is one of the cases in which unmalted grain is employed in the manufacture of beer on the continent of Europe.

"*Koumiss*, or *milk beer.*—Milk, as I have explained in the preceding chapter, contains a peculiar kind of sugar, less sweet than cane sugar, to which the name of milk sugar is given. This sugar, when dissolved in water, does not ferment upon the addition of yeast; but when dissolved in the milk along with the curd and butter, it readily ferments, is transformed into alcohol and carbonic acid, and gives to the liquor an intoxicating quality. This fermentation will take place spontaneously, but it is hastened by the addition of yeast or of a little already fermented milk. The fermented liquid is the *koumiss* of the Tartars. Mare's milk is richer in sugar than that of the cow, and is usually employed for the manufacture of milk beer."—*Johnston.*

Brandy can be obtained from the *koumiss* by distillation. The natives call this milk-brandy *arraca*. In the north of Scotland and in Ireland buttermilk is kept until it undergoes a vinous fermentation.

Ava.—This liquor is used in the South Sea Islands, in the Tonga, Feejee, and Samoan Islands; in short, throughout the Pacific Ocean. It is prepared in very much the same way as the *chica* or *maize beer.*

It is a very interesting and suggestive fact that this method of preparing fermented drink—chewing the *ava* and the *chica*—should exist in regions so far apart as South America and the islands of the Pacific.

The process of making the *ava* and its effects are thus described by Johnston:

"The name of ava is given to the root of the intoxicating long-pepper (*Macropiper methysticum*), which is chewed, either in the fresh or in the dried state, as the Indian chews his maize. The pulp is then mixed with cold water, which after a brief interval is strained from the chewed fibre, and is ready for use. The taste, to one unaccustomed to it, is not pleasant. It reminded Captain Wilkes of the taste of rhubarb and magnesia! According to the white persons who have tried it, this infusion does not intoxicate in the same manner as ardent spirits. It more resembles opium in some of its effects; producing a kind of temporary paralysis, tremors, indistinctness and distortion of vision, and a confused feeling about the head."

Cocculus Indicus is chiefly known as a means of adulterating beer and other drinks. It is very bitter, has a rich taste, and directly affects the brain, and thus produces intoxication.

It is very powerfully poisonous when used in quantity. The poorer classes like to have their liquor drugged with it, because they can "*feel it.*" It takes a less quantity of liquor that has been drugged with *cocculus indicus* to affect one than of pure liquor.

"It is the fruit or berry of the *Anamirta cocculus*, a beautiful climbing-plant, which is a native of the Malabar coast and of the Indian Archipelago. It is sometimes called the Levant nut, or the *Bacca orientalis*. It has some resemblance to the bayberry, and in 1850 was imported into this country (England) to the extent of 2,359 bags, of one hundredweight each."—*Johnston.*

There is no doubt that it is slowly injurious to the system even in moderate doses, and it should be regarded as a crime to adulterate liquors with it. Very much of the intemperance among the lower and degraded classes is caused by the *cocculus indicus* in the liquor which they drink.

A person who has been made drunk by it feels worse after the debauch than one who has been made drunk simply on pure alcoholic liquors.

Sweet Gale.—This narcotic is not known in this country, but is used in Sweden. It is said to be used largely for the purpose of imparting bitterness to beer.

Emetic Holly.—This narcotic is used by the Indians of Florida. The infusion of the leaves is called the "black drink," and, according to Johnston, is drunk largely by the chiefs when about to be engaged in important deliberations.

Siberian Fungus—a kind of toad-stool.—This is a native of Kamtschatka. It closely resembles our common mushroom. It is gathered in the hot weather and dried. It is chewed like tobacco. It produces at first lightness of spirits, then giddiness, flushing of face, and finally, in sufficient quantities, intoxication. Some of our own mushrooms are also narcotic in their effects. It is well known that certain varieties when eaten produce poisonous effects.

Thorn Apple (*stramonium*).—This is indulged in by the Indians of the Andes. From the fruit of the plant they prepare a strong narcotic drink. It produces stupor and sometimes furious excitement.

Among other stimulating and narcotizing preparations I may merely mention—

Arrack, made from rice, used by the Hindoos and Malays.
Raki, " " " Greeks and Turks.
Samshoo, " " " Chinese.
Sacio, " " " Japanese.
Kawa, " macropiper " Pacific Islanders.
Vodki, " potato " Russians and Poles.
Tallah, " millet " Abyssinians.

In surveying the history of the use of these various stimulants and narcotics we learn

1. *That some forms of stimulant or narcotic have been used all over the world, and from time immemorial.*

2. *That their use has increased with the progress of civilization.*

3. *That at the present time they are used to the greatest extent and in the largest variety by the most civilized and Christian nations—England, France, Germany, and the United States.*

According to the recent report of Mr. Wells, special commissioner of revenue, it seems that *the value of the liquors annually sold over the counter in this country alone is equal to half of our national debt.*

This says nothing of tobacco, which is now used so freely; nothing of tea and coffee, which are used in every family, and to the extent of several pounds annually for every man, woman, and child in the country; nothing of opium, which is used habitually by nearly 100,000 of our countrymen; nothing of chocolate (cocoa, shells, &c.), which as a substitute for coffee is found in every saloon and hotel, and freely used in thousands of families.

It is safe to say that the money annually expended for stimulants and narcotics in this country *would pay the whole of our national debt, principal and interest*, and at the same time support all our benevolent societies.

Important and practical questions now arise. Shall we continue to use these stimulants and narcotics? Do they fulfil any purpose in the animal economy? Are they, in any sense, food? Would not the world be better without them? If we are to use them at all, what shall we use? How shall we use without abusing them?

Before attempting to answer these queries I must say, at the outset, that I *cannot* answer them for every individual. Every person must decide for himself, in the light of science and of his own individual experience, whether to use these substances or to abstain from them, just as he decides what kind of food to eat and what to avoid. All I shall attempt to do will be to give information and to arrange facts which may help my readers in answering these questions. All I can do is to present the *general* principles of science, by which my readers may enlighten their consciences and learn their *individual* duty.

There are some general facts that will apply to all these stimulants and narcotics.

1. *They all contain poison.* The active principle of tea is *theine*; of coffee, *caffeine*; of chocolate, *theobromine*; of tobacco, *nicotine* and *nicotianin*; of opium, *morphine*; of hops, *lupuline*; of fermented and distilled liquors of all kinds and varieties (wines, beers, cider, porter, whiskey, rum, gin, brandy, arrack, koumiss, samshoo, sacio, kawa, vodki, toddy, tallah, raki), is *alcohol.*

All these active principles are poisonous. Nearly all of them, when given in sufficient quantities, will kill animals, and in a very short time.

Even *theine* and *caffeine*, in large doses, will kill animals, as has been recently proved by the experiments of Dr. Amory. That nicotine and alcohol will kill animals and men is now known to every one. When *theine* is taken pure by a human being it causes terrible nervousness and distress, and probably a sufficient quantity would prove fatal. The probability is that experiments would show that the active principles of all the other stimulants and narcotics are capable of producing fatal results, when given in sufficient quantities.

The fact that all these stimulants and narcotics contain poison does not assist us much in the solution of the question of their effects on the system, *because there is poison, in nearly all of our ordinary articles of diet.*

There is poison in our garden lettuce, and in the hops with which we raise our bread. The oils contained in our table mustard and pepper, and in that most common and healthy vegetable, the onion, are among the most acrid and destructive poisons with which chemistry is familiar. Phosphorus is one of the most virulent of poisons, and even in very small doses it has been known to destroy life; in moderate quantities it powerfully stimulates, like alcohol. And yet phosphorus exists in all nitrogenous alimentary substances, and has been proved to be indispensable to the vigor and health of the brain. Children especially, who for any long period are confined to food in which phosphorus does not exist to a sufficient degree, are very apt to suffer from disease of the bones and scrofulous enlargement of the glands.

The most skilful chemistry can hardly prepare a meal that would not contain more or less poisonous elements. There is poison in the dry loaf and plainly-served vegetables of the hardy laborer, in the yolk of the egg that we give to the tender invalid, and in the very milk that the infant draws from its mother's breast.

But the use of poison is not confined to our articles of food. Poison is a normal constituent of the atmosphere. Even in the healthiest localities it contains more or less carbonic acid, and not unfrequently slight traces of iodine and nitric acid. Those who are most ignorant of chemistry know that these agents, when undiluted, are terribly destructive and fatal. Therefore, then, not only in every mouthful of food we eat, but in every breath of air we inspire, there are elements of poison that, in a pure and uncombined form, would prove instantly fatal to all animal creation. But the consumption of poisons does not stop with our air and food.

The water we drink or in which we bathe is rarely, if ever, found in a state of absolute purity.

If there be any drink in the world that may properly be called natural, surely it is the waters of our springs and rivers, but all of these contain poisonous substances in greater or less proportions. The purest springs hold in solution the chlorides of sodium, magnesium, or potassium, as well as lime, in combination with sulphuric acid. Even rain-water, the purest of all, contains traces of nitric acid, that it derives from the atmosphere in its passage through it.

2. *They all seem to have the power of sustaining the system within certain limits, and to a certain extent supply the place of food.*

Tea and coffee drinkers know by experience that they can both live and work on their favorite beverages without any solid food whatever. There are thousands—aye, millions—in the world who would give all the rest of the breakfast rather than their cup of coffee. There are millions of ladies in the land to whom their cup of tea is more important—or, at least, seems to be so—than all their other food.

Opium has a wonderful power of sustaining the system, the natives of the East working hard for days on nothing but a little of this drug.

Tobacco has the same power, though to a less degree. Great smokers are usually moderate eaters.

The South American coca has the same effect. The Indians there travel for days subsisting on nothing else.

Alcohol—in all its myriad preparations—is a powerful substitute for food; I therefore term it *negative* food. In fevers, in exhaustion, and in health even, it supplies the place of food. When used largely it impairs the appetite, and may almost destroy it. This fact is a powerful argument against the free use of this agent.

Everybody knows that sots and debauchees are usually moderate eaters. The confirmed drunkard always prefers his grog to his dinner. Those who indulge in champagne and brandy to any extent partake less freely of the solid articles on the table, even when the system is in excellent health, and all the conditions for a vigorous appetite are fulfilled. The fact that drunkards eat so little, and even neglect their meals, has long been so patent to superficial observation, that temperance men have seized upon it—and with good reason—as an argument against intemperance. The body needs positive, solid nutriment, and any great excess in the use of alcoholic liquors must so benumb the appetite that it will not crave sufficient food to keep the system in its best working condition.

The classes who are poorly fed, half starved, are apt to indulge excessively in alcohol.

It is chiefly the poorer and laboring classes—mechanics, artisans, draymen, stevedores, and the like, who breathe impure air, in close tenant-houses, whom poverty compels to subsist on meagre and insufficient food—that particularly appreciate the need of the "accessory or *negative* food" supplied by alcoholic stimulants. They find by experience that, under the depressing circumstances in which they live, move, and have their being, they can work harder and longer with their glass of beer, or perhaps of whiskey, than without it. It is a matter of fact, which very few recognize, that most of the liquors are used by the poorer and laboring classes.

This fact, that the lower orders of society are the chief consumers of ardent spirits, is of such vital import in the study of social economy, that it is hard to understand why it has been so strangely ignored. New York City consumes an immense quantity of fermented and distilled liquors—more especially the beers and whiskey—but the greater portion of it is used by the occupants of the tenant-houses.

Indeed, most of our grog-shops are located in those quarters of the city that are frequented by the ignorant and the lowly. The intelligent and wealthy do indeed keep wines and brandies in their houses—and there are a small minority who use them regularly and freely at dinner, or on other occasions are habitual and it may be excessive drinkers—but take the country through, the lower orders of society, in proportion to their numbers, use far more of intoxicating drinks than the intelligent and cultivated.

Very many experiments have been made in order to determine in what way stimulants and narcotics thus sustain the system and take the place of positive food.

It is the opinion of many able physiologists that stimulants and narcotics—or some of them, at least—*retard the change of tissue.* In nautical language, they "slow the fires" of the system.

Alcohol and opium are now very largely and very successfully used in the treatment of many of the severe fevers and inflammations. They have, in a measure, taken the place of *bleeding and calomel.*

3. *They all are liable to make slaves of those who indulge in them to excess.*

It is an interesting fact, however, that most of the intoxication from alcoholic liquors of civilized lands is confined to the ignorant and low-born.

In spite of all the warnings that have been given to the children of aristocracy, the fact remains, that among the educated and influ ential the number of those who go down to drunkards' graves is so exceedingly small, that any isolated case that occurs elicits the deepest interest and sympathy. Among these classes—even among students and graduates of colleges—there are not a few who at some period of their lives occasionally make excessive use of intoxicating drinks, but yet not in such a way as to be grossly intemperate. According to the police reports of New York City, and the valuable statistics of Mr. Halliday, of the Five Points Mission, nearly all of the arrests for intemperance in the Metropolitan district are from the lowest rank of foreigners.

In England, also, gross intemperance is comparatively rare among the educated nobility, but is distressingly common among the peasantry. The truth is, the intemperance of the poor and ignorant is more the *result* than the *cause* of their depressed condition. The logical explanation of this is not difficult. "Accessory food" in the form of whiskey and beers compensates in a measure for the insufficiency of their diet. Moreover, the tonic properties of alcohol temporarily brace them against the evil effects of foul air and damp, gloomy homes. Then again, the classes who are thus unfortunately circumstanced in regard to material comforts are usually still more deficient in moral and mental training, and when once hunger or thirst or weariness has driven them to the bar-room, they have not sufficient moral force to stop when they have supplied the demands of nature; hence follow intemperance and its long catalogue of woes. This is, after all, the natural history of every form of vice. I say, then, that intoxication from alcoholic liquors is pre-eminently the vice of ignorance and poverty. In proportion as communities grow at once wiser and better, in that proportion do they become more temperate. The ruling classes of England during the last century were far less moderate in the use of ardent spirits than the nobility of the present day.

The Roman patricians were almost as great debauchees at their feasts, even on their meagre variety of drinks, as are the common laborers of our day in the ale-houses and corner groceries.

Rome cultivated the minds of her youth, but not their morals—thus the citizens yielded to gluttony and intoxication. The Spartans cultivated both mind and morals, and were paragons of sobriety.

In our day the educated ruling classes of society injure themselves more by tobacco than by alcohol. Among the very highest classes even coffee injures more—though in a very gradual way—than alcohol.

Our people are not able to bear tobacco and coffee, or even tea, as formerly, or as perhaps their fathers and mothers were able to do.

The types of constitution change with the progress of civilization, and the food and drink must change accordingly. Very many of my patients tell me that they cannot use coffee or tobacco at all, and some are obliged to forego even tea.

Tea is used too strong in this country, and there are thousands of ladies especially who subsist on it too exclusively, and are therefore seriously injured by it. Tea in excess begets nervousness, sleeplessness, dyspepsia, headache, constipation, hysteria, and all forms of nervous disorder. Its evil effects come slowly, but they often come too surely. Coffee injures more than tea. Coffee and tea are both excellent drinks, and fortunate are they who can use them without injury.

Those who work hard with their muscles in the open air can use tea, coffee, tobacco, more freely than those whose lives are sedentary and confined. During the late war the soldiers and sailors thought more of their coffee and tobacco than of all their other rations.

4. *They vary in their effects in different climates.* Tea is a product of temperate climes, and can be used with about equal benefit everywhere and in all countries, and with no greater injury in one country than another. *It is, however, more largely used in cold or cool latitudes.* The Russians are the greatest tea-drinkers of the world, next to the Chinese. Tea is very freely used in England. In France, Italy, Spain, and Turkey, coffee, in a certain measure, takes the place of tea. In our own country tea is more used in the Northern States and coffee in the Southern.

Coffee is a product of warm climes, therefore it can be used more freely in the torrid and sub-torrid zones than in the colder regions. The nations of the world seem to find this out by instinct, for the inhabitants of hot countries in both hemispheres use coffee very freely, while those of the colder regions in a measure substitute for it tea and alcoholic drinks.

During the late war our soldiers and sailors on the Union side used far more coffee, and probably without serious injury, than they had been wont to do in their Northern homes.

In 1864 and 1865 I was acting for a year and a half as surgeon in the navy, on the blockade in Farragut's squadron in the Gulf of Mexico. When I first arrived at the station,—which was off the coast of Texas,—and, indeed, for a number of months, I continued to abstain from coffee, as all my life I had been obliged to do in the North. Gradually, however, I fell into the habit of the officers about me, and began to drink strong coffee three, four and five times daily. To my surprise I found that instead of being made nervous, sleepless, and dyspeptic by it, as would have been the case had I indulged even in a single cup at home, I actually improved in my health, and ever afterwards during my stay I persevered in taking the beverage at all my meals, and frequently at habit lunches.

When I returned to the North I was obliged almost immediately to stop my allowance of coffee, and have never since indulged in it. Shortly after my return I met a very intelligent gentleman, who had visited all the Southern States, and who related precisely the same experience in regard to the use of coffee. It is the habit of the Southerners to drink strong coffee on rising in the morning, at breakfast, and during the day as they may wish it. The same customs are observed in the warm countries of Europe.

Opium can apparently be used more freely in the warm countries of the East than in other parts of the world. Of the 400,000,000 who habitually indulge in the drug, probably only a comparatively few are ruined by it. Medical travellers in the East report that opium eating does not usually have as marked injurious effects on the inhabitants as it does with us. There are, of course, thousands who there use it to enormous excess, become slaves to it, and are made wretched indeed.

It is not possible that opium-eating will ever become a national habit in America. Of the 100,000 in this country who are said to use it, nearly all first resorted to the drug as a relief from pain. In Europe and America our tobacco, our tea, and our various forms of fermented and distilled liquors have saved us, and will continue to save us, from the opium-eating habits of the East.

Alcohol is a product of both temperate and warm climates, and can be used in all the latitudes. It seems, however, to be most injurious when excessively used in extremely hot or extremely cold climes. Nearly all travellers agree that in the polar regions or in the tropics more injury than benefit results from a large amount of alcohol in any form.

Tobacco, like tea, is a product of temperate latitudes, and like tea it can be used without any special or markedly observed differences of effects in all countries. Like tea, it can be indulged in with comparative impunity in the regions of the tropics and of the poles. All the injurious, all the beneficial, and all the negative effects of tobacco seem to be about equally observed in all latitudes. If there is any difference whatever in its effects in the various climates, it is this, that it can be used most freely in those which are warmest.

5. *They all vary in their effects on different constitutions.*

Chocolate, cocoa, shells—all these are mild drinks, but there are those to whom they are positively noxious.

Tea acts very differently with different temperaments. I know a man who is so exceedingly sensitive to this beverage, that even a cup of the very weakest tea will keep him awake all night. I know many who cannot habitually use tea in any shape. On the other hand I know many—and so do we all—who can take several cups daily of the very strongest tea without showing any effects from it.

Coffee is terribly poisonous to very many, especially in our northern latitudes, while others can indulge in the charming beverage to an almost unlimited extent. I am convinced that the number of those among us who cannot drink coffee is increasing. I account for this by the changes being made in the type of constitutions. We are growing more impressible, more nervous, and more sensitive to those drugs and agents that directly affect the nervous centres. I doubt whether more than half of those in this country who lead sedentary and confined lives can habitually use coffee with impunity. Those who labor hard with their hands out-doors can use it more freely.

Opium very rarely has the effects described in De Quincey's "Confessions of an Opium-Eater." Even those who use it to enormous excess do not usually experience any of those dreamy visions which his gifted imagination has pictured in such brilliant and hideous colors. Opium varies in its effects even when given in small doses. The majority are put to sleep by it, but some it keeps wide awake. There are those whom it makes actually raving.

Alcohol varies in its effects with different constitutions. There are *many hundred different* forms of fermented and distilled liquors now in use in the world. The differences between these are very wide.

The strongest whiskeys, brandies, rums, gins, &c., contain over *fifty per cent.* of alcohol. The stronger wines—port, madeira—contain from *ten to twenty per cent.* of alcohol. The weaker, lighter wines, as hock, claret, Burgundy, champagne, contain from *five* to *ten* per cent. *Ales, porter*, and *cider* contain but from *three* to *six* per cent. of alcohol.

It is manifest at a glance that these different forms of alcohol must not only vary widely in their effects, but also in their effects on the same individual; for besides the alcohol, all of them contain *other important substances, on the proportions of which their influence on the constitution must very materially depend.* Some can drink claret, Rhine wines, hock, cider, beer and porter, and are unable to use rum, gin, or brandy. Some can drink beer, but not cider. Hard cider with many makes the head ache. For others it clears the digestion, corrects the liver, and sharpens the appetite. Gouty patients are oftentimes unable to take a drop of champagne, or acid wines of any kind or in any quantity, without paying terrible penalties. Many who cannot use brandy, even when largely diluted, find that claret, Burgundy, and even champagne, give them no discomfort.

There are no special rules to guide one in the selection of wines. If one feels that he must use wine, let him find out by *experience* what kind serves him best. As a rule, claret and Rhine wine agree with more persons than any other kinds of wine that reach this country. There is no question, however, that wines are luxuries and not necessities for us, and that life and health can be perfectly maintained without them. One of the strongest arguments in their favor is, that they keep us from abusing ourselves with stronger liquors, and with other and more potent forms of accessory food, such as tobacco, opium, and coffee. But tea and coffee, opium and tobacco, are, strictly speaking, luxuries, although in our modern civilization they have long been deemed as actual necessities. There is no question that health and life, at least in individual cases, can be maintained without any of these substances.

Tobacco varies wonderfully in its effects with different individuals. With many the first whiff of a cigar is disagreeable, and the first "cud" absolutely nauseous; but there are very few who cannot become so accustomed to the drug as to enjoy it. I must, however, plead an exception.

Tobacco dries up some, fattens others. In some it causes dyspepsia, in others it relieves it. Some use it to keep awake, others to promote sleep. With all persons, or nearly all, it has a tendency to diminish the appetite, and within certain limits to take the place of ordinary food.

Persons who have been slaves to tobacco very often suddenly or gradually break up the habit; the results are of the most opposite character. Some at once improve in health, grow fatter and stronger; others at once go backward, and grow thinner and weaker. It constipates some and relaxes others.

On many it produces all the horrors of extreme nervousness. Some it makes brilliant, others it stupefies.

Some take a smoke *before* going to battle, to fortify them for severe and unusual effort; others take it *after* the battle, when their effort is completed, to calm their nerves and soothe them to slumber.

6. *They vary in their effects at different ages and times of life.* The reason of this is quite apparent. The constitution varies at different times of life. The size and quality of the brain, of the muscles, of the bones, vary wonderfully between infancy and old age. A youth of twenty-one is a different being from what he was at the age of one year. A man in middle life is a different being from what he was at twenty-one. An old man at seventy is a very, very different being from what he was at middle life.

It is very clear, therefore, why our food acts differently with us at different periods of our life. Our food is almost a constant quantity. It does not vary much in its quality from year to year, while our bodies into which it enters are ever changing. As with ordinary food, so with stimulants and narcotics.

Many who have been accustomed to indulge, as they desired, in tea, or coffee, or tobacco, or chocolate, or in some form of fermented or distilled liquor, find sometimes that they are obliged to discontinue the use of some one or all of them. The rule works both ways. I have had patients who have found by trial and experience that they could use with impunity, and perhaps with benefit, stimulants and narcotics which formerly were exceedingly injurious to them.

There are many who are obliged to abstain from coffee all their lives until they reach old age, when they find, to their great surprise, that they can use it freely. Probably this experience would be repeated more frequently if people only made trial of themselves in this respect every year or two during their lives.

Infants should not habitually use stimulants and narcotics. Those who are growing need positive and not negative or accessory food. Their tissues need to be changed rapidly in order that the growth may be carried on. In infants the brain and nervous system is but little used, and therefore but little needs the aid of stimulants and narcotics. The intuition of the people everywhere is opposed to the use of these substances by very young children.

For the same reason, *children and youth should not use stimulants and narcotics until they arrive at years of discretion.*

There are two very decided arguments against the use of tea, coffee, tobacco, fermented and distilled liquors, by those who are under fifteen or twenty years of age. *First*, they do not at that time need *negative* food, but on the contrary as much positive food as they can digest. Growing children need fresh meat, with fish, oysters, good vegetables, wholesome fruit, and all in a palatable variety. They do not need anything that will interfere with the rapid changes of tissue that always accompany the growth of the body. *Secondly*, children and youth have not sufficient self-control and force of mind to use these substances without becoming in a sense slaves to them.

It would be better for the young and growing generation if they abstained entirely, or nearly so, from tea, coffee, until fifteen or twenty years of age, to say nothing of tobacco, fermented and distilled liquors. Our children drink tea and coffee too young, and in too large quantities. Like all of us, they take their *tea too strong*. The best drinks for children are milk, cocoa, and water.

Still further, *if young men would abstain entirely from tobacco and alcoholic liquors until the age of twenty-five or thirty, intoxication and all forms of intemperance would be almost unknown by the next generation.*

Intemperance in the use of tobacco and alcohol is usually the result of habits formed in youth, or before the age of twenty-five or thirty.

On the other hand, persons of mature age, and especially those in the decline of life, are usually benefited by a reasonable indulgence in tea or coffee.

In the very aged the digestion is often weak, and therefore the sustaining power of stimulants and narcotics is especially grateful. Tea is pre-eminently the drink for the aged. Undoubtedly there are many even among old people who injure themselves by tea, coffee, as well as by tobacco and alcohol; but the proportion of persons over sixty who thus injure themselves is very small indeed in comparison with the thousands of youths who are undermining their manly vigor and impairing their prospects for usefulness by indulging in these forms of negative food.

7. *They are nearly all liable to be adulterated.*

Tea is adulterated with at least twenty-five different herbs or imitations that more or less closely resemble the original article. Green teas are adulterated in China, according to Mr. Fortune, by adding to them various coloring substances. Prussian blue and gypsum are much used for this purpose. The Chinese never drink the adulterated teas, but sell them to foreigners, because they bring a higher price. Indigo is also used for the purpose of adulteration. Tea is also much adulterated with what is called "lie-tea," which is composed of the sweepings and dust of the warehouses.

Coffee is largely adulterated with chiccory, as everybody knows. Chiccory itself is adulterated with Venetian red, and the Venetian red is adulterated with brick-dust. (See chapter on *Adulterations.*)

Fermented and distilled liquors are adulterated in thousands of ways; even pure *hard cider* is difficult to obtain in our cities. Much of the cider that is sold in the saloons is made of sugar, water, and tartaric acid. Sometimes I have searched for a long time in New York, and in many different stores, for pure hard cider, and without avail. The bottled cider is very apt to be impure. Sulphite of soda and other chemicals are mixed with it in order to preserve its sweetness. It is very unfortunate that it is thus difficult to get pure hard cider, for it is a most valuable beverage. It is usually an excellent drink for the nervous and dyspeptic. It is the Rhine wine of America, and better, far better would it be for our American ladies if they took more hard cider and less tea and coffee.

Malt beer is adulterated with *cocculus indicus*, tobacco, sweet flag, sweet gale, yarrow, and thorn-apple. The Javans adulterate their rice beer with cakes, made of onions, black pepper, and *capsicum* (Johnston). It is *not* adulterated with *strychnine* to any extent.

Wine is adulterated with poppy-heads, and in myriads of ways that it is not necessary to mention.

Pure wines can be obtained in this country from California, and also from Europe, by those who will take special pains and make the matter a study. In wine-making countries the pure article is as common as water. It may yet be so with us. The introduction of pure wine into our country would not cure intemperance, though it might diminish its horrors. Intemperance is the vice of poverty and ignorance, and can only be driven from the land by the introduction of *knowledge*.

Ardent Spirits,—rum, gin, brandy, and whiskey,—as everybody knows, are adulterated to a most fearful degree. Even those who pay the highest price are by no means sure that they obtain the pure article. All of these drinks are manufactured from chemicals.

According to the recent analyses of Prof. J. C. Draper, fusel oil and other bad ingredients are found in highest-priced liquors, and in the most aristocratic hotels and saloons of New York City. These adulterations are not all, however, of such a kind as to seriously injure the health, but all of them are less beneficial and more injurious than alcohol. The rums, gins, whiskeys of the poorer classes are horrible mixtures, and thoroughly deserve their well-known title—"chain lightning." *Much of the intemperance of the poorer classes is produced not so much by alcohol as by cocculus indicus.* It is a terrible substance, and is terribly pernicious. It is largely used in the adulteration of beer.

But, after all, it is an exaggeration to say that pure, or nearly pure liquors cannot be obtained in this country. However it may have been in the past, *there is no question that at the present time it is entirely possible to obtain pure wine, and nearly pure liquors, of some other kinds, provided we go to the proper authorities* in such, and make the matter a special study. They will, at least, be about as near to absolute purity as our tea, our coffee, or our tobacco. Brandy and champagne are very rarely found here in absolute purity.

The *Boston Journal of Chemistry*—a good authority—says that thousands of gallons of claret are made by allowing water to soak *through shavings*, and adding thereto a certain *portion of logwood and tartaric acid, and a little alcohol.* Good judges can hardly tell the difference between this mixture and the genuine article.

This is unfortunate, for good, pure claret is one of the best of our wines, and is the least liable to injure.

According to Pereira, molasses, sugar, and honey are used to increase the weight of tobacco, and also to make it more palatable. The leaves of the rhubarb, the beech, the walnut, mosses, bran, beet-root dregs, liquorice, rosin, yellow ochre, fuller's earth, sand, saltpetre, common salt—all these substances have been detected in tobacco.

Our ordinary articles of food are likewise adulterated. It is difficult to obtain pure groceries of any kind. It is unfair to claim that all the adulteration of the country is confined to the dealers in stimulants and narcotics. The same difficulty is felt across the water.

In the light of the facts here presented, it is evident that every one owes it to the *cause of temperance* to extend a knowledge of the effects of stimulants and narcotics among all classes. The evils of intemperance in the use of stimulants and narcotics, and especially in the use of alcoholic liquors, are so terrible and so gigantic *that all good citizens should combine their best efforts to diminish it.* With all its errors, excesses, and misfortunes, the temperance cause has been one of the most successful reforms of modern times. *The great antidote of intemperance, as of every other evil, is Education.* If our children were all brought up to a knowledge of the important facts concerning stimulants and narcotics—their nature and effects on the constitution, in moderation and in excess, in health and disease, in youth and in maturity, in different climates; *the mischievous and deadly adulterations* to which, in these days, most of them are so liable; the history of their rise and popularization in modern society, and their effects on civilization—

if these subjects were continually impressed on the minds of all the rising generation everywhere, intemperance, with all its wretchedness and woe, would be practically driven from the world. Our people perish for lack of knowledge.

During the past three centuries there has been great progress in sanitary science; and one important reason why men live longer now than formerly is, that better attention is given to the laws of health. It was not so much obstinacy, or perversity, or love of slow suicide, that made the people of the middle ages neglect to clean their streets, as ignorance of the great fact which now all admit, that filth engenders disease. Just so the majority of drunkards and slaves of opium form their evil habits, not so much through a wicked desire to destroy themselves, as through erroneous or exaggerated ideas concerning the nature and effects of these substances.

The introduction of pure cheap wines into our country might somewhat diminish intemperance, but would by no means eradicate it. There is intemperance in France and Germany, where wine is drunk as freely as are tea and coffee with us; although, according to statistics which I gathered while in Europe, there is much less of it in Germany than in England and the United States. Wherever there is an ignorant and degraded population, and the material on which to get drunk, there we shall surely find more or less intemperance, although the habit is very much modified by climate and national temperament. The Anglo-Saxon race is especially inclined to intemperance. The vice was formerly common and popular among the ruling orders of English and American society, and was not regarded as a disgrace. Thanks to the temperance movement and the general progress of the race, drunkenness has long since ceased to be a fashionable vice either in England or America. The habit condemns a man in society, and blasts his prospects. With some painful exceptions, intemperance in these countries is confined to the ignorant and degraded.

8. *They all may be used so as to directly injure the nervous system.*

Tea is one of the mildest of the stimulants, and yet there are thousands who are injured by it. Coffee injures more constitutions among the *intelligent* classes of American society to-day than is commonly supposed. It would be better for our American ladies if they would use less tea and coffee and more cider, sour wines, and good beer.

It is a very significant fact that the men of America—even those who indulge freely in tobacco and in fermented and distilled liquors—are much healthier and stronger than our women, who rarely use these substances, but use more tea and coffee than their lords. The complicated question arises, Why is this so? Is it not, at least, probable that our wives and mothers would be stronger if they would use less tea and coffee, and more cider, beer, and wine, like the Germans, French, and English?

Coffee injures thousands. Only a fractional portion of those who lead sedentary lives in America can drink it habitually all their lives. It can bring on every nervous symptom imaginable.

Tobacco is capable of producing nearly every possible nervous symptom. *Dyspepsia, hypochondriasis, neuralgia, sleeplessness,* are sometimes caused by it.

Tea and coffee give rise to the same disorders even more frequently than tobacco. Insanity has been charged upon tobacco, and it has been stated that the increase of insanity in our modern civilization is largely due to the increase in the consumption of tobacco. This statement cannot, however, be proved, and is not at all probable. *There is an immense amount of false reasoning on this subject.* A person who has been in the habit of using tobacco is taken insane. Some of his friends, who may not themselves use tobacco, and who regard chewing and smoking in public as breaches of etiquette, as they truly are, at once give out that his insanity was caused by tobacco. This inference they have no right to make. They might with just as much propriety have charged his insanity upon the tea or coffee, or cider or beer, which he may very likely have been in the habit of using.

They might even have charged it upon his daily food, for there is no question that bad diet often brings on nervous diseases.

On the causes of insanity, Dr. Maudsley makes the following judicious remarks:

"Perhaps one, and certainly not the least, of the ill effects which come from some of the conditions of our present civilization is seen in the general dread and disdain of poverty, in the eager passion to become rich. The practical gospel of the age, testified everywhere by faith and works, is that of money-getting; men are estimated mainly by the amount of their wealth, take social rank accordingly, and consequently bend all their energies to acquire that which gains esteem and influence. The result is that in higher departments of trade and commerce, speculations of all sorts are eagerly entered on, and that many people are kept in a continued state of excitement and anxiety by the fluctuations of the money market. In the lower branches of trade there is the same eager desire for petty gains; and the continued absorption of the mind in these small acquisitions generates a littleness of mind and meanness of spirit, where it does not lead to actual dishonesty, which are nowhere displayed in a more pitiable form than in certain petty tradesmen. The occupation which a man is entirely engaged in does not fail to modify his character, and the reaction upon the individual's nature of a life which is being spent with the sole aim of becoming rich, is most baneful."

The truth is, that no one has a right to charge the nervous diseases —insanity, or any other form—of any individual upon any special kind of diet, or of stimulant or narcotic that he may have been in the habit of using, without overwhelming evidence and after the most careful study. It is indeed extremely difficult for a physician—whose life is devoted to the study of disease—to decide in any given case of dyspepsia, neuralgia, paralysis, hypochondria, sleeplessness, debility or insanity, whether the symptoms were or were not brought on by the tea, the coffee, the tobacco, or the alcohol that the patient has been accustomed to use. The newspapers report at times that tobacco has caused death. Some of our books on hygiene declare that insanity has increased of late years in direct proportion to the increase in the use of tobacco. Now it is impossible for one not a physician to *tell in any given case whether death has been caused by tobacco, or by tea, or by coffee, or even by alcohol, except in very marked cases indeed.*

Therefore, all such reports are unreliable. Precisely so with the relation of insanity to the use of tobacco. The question is a very, very complicated one, and cannot so easily be answered. It is true that insanity has somewhat increased of late years—though not to the extent that is commonly supposed. It is also true that the consumption of tea, of coffee, of tobacco, of alcohol, and of opium has greatly increased in our civilized land. Shall we attribute the increase of insanity to the tea, the coffee, the tobacco, the alcohol, or the opium? We see at once that the question is very difficult to answer.

Still again, there has been a wonderful increase in the cares, the labors, the anxieties, the passions, and the strifes of our modern civilization. Over-work and over-worry of the brain are the great causes of diseases of the brain. But, after all, it appears from statistics recently published that insanity has not increased to the extent that is commonly supposed.

That nervous diseases in general have increased, there can be no question; but this increase is probably due more to the passions and strife of our modern civilization than to the use of any special article of food or drink.

Alcohol, when used in large quantities and for many years, un-

questionably injures the brain and nervous system. This view is confirmed by actual examination of the brains of those who have died drunkards. Alcohol also injures the liver, the stomach, and indeed the whole system. There is, however, great liability to err, just as in the case of tobacco. Because a man who has been addicted to alcohol dies, even in his prime, of some disease of the brain, stomach, liver, or other vital organ, we are by no means always justified in convicting him of death from alcohol. So many causes are continually acting upon us that the question is a very complex one, and can only be answered after careful study and close investigation by some professional authority.

There are two well-known diseases that come from the abuse of alcohol. They are *delirium tremens* and *chronic alcoholism.* The symptoms of the former are well known, and need not be here repeated.

The symptoms of *chronic alcoholism* are (according to Marcet)—

1. Inability to sleep.
2. Trembling.
3. Giddiness and headache.
4. Hallucinations.
5. Weakness.
6. Difficulty of breathing.

All of these symptoms may come from a thousand other causes besides the abuse of alcohol, and in any given case it is impossible even for a physician to settle the question without very close scrutiny. Of late years much attention has been given to the reformation of drunkards. It is now well understood that *intemperance* is very often a symptom of *insanity.* It is a kind of *mania*, and has been honored with various special names—"*dypsomania*," "*methomania*," "*vinomania*," &c., &c. This *mania* may be the *result* or the *cause* of intemperance. Long-continued abuse of alcohol may so injure the brain that the victim becomes insane on that subject, and is unable to control his appetite. On the other hand, insanity, however produced, may give rise to intemperance.

In either case the patient should, if possible, go to an inebriate asylum. This disease, if taken early, and well managed by skilful hands, is nearly as curable as any form of insanity. The State reports of the asylums are very encouraging. *Much of the intemperance of our time, especially among the educated classes, is the result of insanity, and should be treated accordingly. The pledge never saves such patients. For such total abstinence is a duty.* If they cannot control themselves, let them, if possible, go to an asylum.

Opium, when used habitually and for a long time, produces worse effects than tea, or coffee, or alcohol, or tobacco.

These effects have been very forcibly described by De Quincey, and in the work recently published, entitled "The Opium Habit." All of the writers on the subject are, however, inclined to exaggerate the horrors from which they have suffered. Thousands take opium and take it habitually, and take it in large doses and for a long time, and yet never experience the dreams of De Quincey, or the sufferings depicted in the "Opium Habit."

The results of opium-eating must depend, and very manifestly, on the temperament. That opium is the most powerful for evil of any of our common stimulants and narcotics, all will admit. If the habit of opium-eating were to become universal in our climate, I should tremble for the results. I have no fear that we shall ever be thus afflicted. Our tea, our coffee, our tobacco, our large and abundant variety of fermented and distilled liquors, every year improving in quality, will undoubtedly continue to save us from the horrors of opium in the future as they have done in the past.

I am inclined to forgive tea, coffee, tobacco, and alcohol whatever evil they have wrought in the world, for this one great redeeming benefit—that they have, in a good measure, delivered us from the opium-eating habits of the East.

Opium-eating, like the use of alcohol, is often a symptom of disease of the brain. Like chronic alcoholism, it may be either the result or the cause of mental disease. This affection, which is, I am happy to say, quite rare in our country, is called *opio-mania*.

9. *They have never been successfully prohibited by law.* A complete history of the attempts that have been made in various countries to prohibit or regulate the sale or use of stimulants and narcotics would be exceedingly interesting.

Law has been directed not only against alcoholic liquors, but also against opium, against tobacco, and against coffee.

The government of China used vigorous and desperate measures to prevent the introduction of opium in that country, but it failed.

Opium, however, has been less opposed by law than tobacco, and possibly that may be one reason why it is less used at the present. Always and everywhere the breeze of opposition fans the flame of enthusiasm, and it is as true now as in Bible days, that bread eaten in secret is pleasant. Nothing advertises a substance so thoroughly as to oppose it by law.

It is with stimulants and narcotics as with books. The more widely and severely are they criticised, the better the sale.

Tobacco made trouble everywhere, and has fought and triumphed in more battles than any other stimulant or narcotic.

King James I. of England wrote, as everybody knows, a terrible counterblast against it. In the beginning of the seventeenth century, Abbas, the first Shah of Persia, "proclaimed that every soldier in whose possession tobacco was found would have his nose and lips cut off, and afterward be burnt alive." One of the Sultans of Turkey—Amurath IV.—made the use of tobacco a capital offence. Another Sultan ordered that every one who was caught in the act of smoking "should have his nose pierced with his pipe." One of the Czars of Russia punished smokers with the bastinado and the cutting off of the nose. A bull was thundered against the habit of smoking and snuff-taking in church by Pope Urban VIII.

Alcohol has been regulated and prohibited in every way conceivable. The history of the laws that have been enacted against this substance would make a volume.

The recent enactments that have been made in this country—our prohibitory and license laws—are very familiar, and need not be cited.

Coffee also has triumphed over great opposition. In Constantinople the priests used all their influence against it, but in vain. In France, Madame Sévigné—a high literary authority of the time—tried her best to prevent the popularization of the beverage. In London, also, coffee found virulent enemies, but there, as everywhere, it triumphed over all.

From a very interesting paper in a recent issue of "Appletons' Journal" I extract the following. We see that our good forefathers also were unsuccessful in their legislative attempts against stimulants and narcotics, even under the most favorable circumstances.

"In the good old times of which we write, it is evident that the evils of intemperance were as great as they have ever been in any portion of our history. Mr. Winthrop complains bitterly of the amount of hot drinks consumed by the young people on board the Arbella during the voyage from Southampton to America; and every art of legislation was devised to check the ravages of this vice, short of absolute prohibition, or any restriction upon the *private* use, by the more respectable members of society, of what is sometimes termed in the statute 'the good creature of God.' Mr. John Josselyn, gent., who visited Boston eight years after its settlement, says: 'I found two houses of entertainment, called ordinaries, into which if a stranger went, he was presently followed by one appointed to that office who would thrust himself into his company *uninvited*, and, if he called for more drink than the officer, in his judgment, thought he could soberly bear away, he would presently countermand it, and appoint the proportion beyond which he could not get one drop.'

"The custom of 'drinking one to another, which draweth the abominable practice of drinking healths,' is positively forbidden by law. Among the reasons assigned by the General Court for this order, are the following:—

"'1. It was a thing of no good use.

"'2. It was an inducement to drunkenness, and occasion of quarrelling and bloodshed.

"'3. *It occasioned much waste of wine and beer.*

"'4. It was very troublesome to many, especially the master and mistress of the feast, who were forced thereby to drink more oft than they would.'

"Drinking with disreputable associates, more especially if it was not accompanied by judicious and timely remarks on the evils of intemperance, also appears to have brought the offender under the reproof of the magistrate. Thus 'Benj. Hubbard is solemnly admonished of his failing for being in company with James Brown and the rest, and often drinking of the strong-water bottle with them, *and not reproving them.*'

"A man, convicted of drunkenness in the year 1633, was sentenced to attend every day upon the session of the General Court, and in their presence wear the ominous scarlet cloth, with the letter D inscribed upon it. The thought will here suggest itself, whether some such exhibition as this might not have a salutary effect upon our modern representative assemblies, and also whether the general aspect of these bodies would not be somewhat enlivened if the erring *members* thereof were adorned in like manner with scarlet.

"Some time before the transfer of the patent to America, a petition was forwarded to the Massachusetts Bay Company to this effect: 'We especially desire you to take care that no tobacco be planted under your government, unless it be some small quantity for mere necessity and for physic, for preservation of their healths; and that the same be taken privately by *ancient men*, and none other.' It would appear as though 'the ancient men' were a little inclined to monopolize the poisonous weed.

"A few years later, we find that the court felt it to be necessary to relax in some degree the rigidity of the law; for it is ordered 'that no person shall take any tobacco *publicly;* and every one shall pay one penny for every time he is convicted for taking tobacco in any place.' Still later, the law is again modified: 'It is further ordered, that no person shall take tobacco privately, in his own house, or in the house of another, *before strangers;* and that two or more shall not take it together, anywhere, under the penalty of eleven shillings and sixpence for every offence.'

"From the tone of legislation adopted soon after this, we may infer that the early settlers of Boston found it as hard to regulate such matters as these by law as their posterity have proved it to be. 'This court, finding that, since the passage of the former laws against tobacco, *the same is more abused than before*, it is therefore ordered that no man shall take any tobacco in the fields, except in his journey or at meal-times, upon pain of twelvepence for every offence; nor shall take any tobacco in any inn or common victualling-house, except in a private room there, so as neither the master of the same house, nor any other guests there, shall take offence thereat.' Constables are further charged 'to take special notice of common coasters, unprofitable fowlers, and tobacco-takers.'"

I cannot attempt to lay down rules for my readers in regard to the use of stimulants and narcotics, as it would be in regard to the use of ordinary food. In all these matters each one must work out his own salvation with fear and trembling. *The individual experience of every man is a better guide than all the books on hygiene that have ever been written.*

All that I can do in this book—all that any scientific man can do—is to collect and arrange the *general* facts that bear on these subjects; to present the results of scientific study and the experience of mankind. By the light of these facts let each one guide his own life.

If you find by experience that you are positively benefited by any one of these stimulants or narcotics, then use it with the same judgment and moderation that you would use any article of food on your table.

If you find that you are becoming a slave to any one of these substances, disentangle yourself and make yourself master of the situation at all hazards and at whatever cost. You may know that you are abusing your favorite stimulant—be it tea, coffee, tobacco or alcohol—when you find that you are such a slave to it that you cannot possibly do without it.

If, on the other hand, you find by experience that you are injured by any stimulant or narcotic that you may be in the habit of using—*no matter how moderately*—drop it as you would drop a hot coal, and never give it another thought, even though you see your friends about you on every hand using the same substance even more freely than yourself, not only without injury, but with real apparent benefit. In these matters every man must be a law unto himself. Some facts of my own personal experience may be of interest to my readers, and may perhaps help to illustrate the doctrine I am here endeavoring to teach.

At no period of my life have I been able to smoke even the mildest cigar, without experiencing immediate and long-continued uneasiness.

I have frequently experimented with smoking in order to test its physiological effects, and I have always found that, although it gave intensity and clearness to the mental operations, yet its influence on the nervous and digestive systems especially were so pernicious that I feel positive that even a moderate indulgence in the use of the weed for any length of time would undermine my constitution. I therefore totally abstain from tobacco—although I see about me on every hand those who use without injury a number of cigars daily—and although I am well assured that there are thousands who can smoke and chew and take snuff, even to a good old age, without any perceptible injury to themselves or their posterity. The law for them is not the law for me. While the use of tobacco may be right and proper for them, for me it would, with my present knowledge of its effects on my constitution, be a positive crime.

Coffee also affects me injuriously, and in very much the same way as tobacco, though with less rapidity. Therefore I very rarely indulge in it.

Weak tea in very closely restricted quantities seems to have on me only a pleasant effect. I strongly suspect, however, that I should do better to abstain from it altogether, and I should do so, provided I could always be sure of some warm drink of a different kind, or of some quality of acid wine.

Ale and porter, as we find them generally, affect me very capriciously. Therefore I do not habitually use them.

Hard cider and mild acid wines—claret, Rhine wine—almost affect me beneficially, and accordingly I frequently, though by no means regularly, use them. I go for weeks using them almost daily, and again weeks pass in which I do not think of them.

If I could always obtain them I should use them oftener, and take them at meal-time instead of tea or water.

The stronger liquors—whiskey, brandy, and the like, or even the heavier wines, sherry, port—I rarely use, because they seem to do me only harm.

I have presented my personal experience in this detail, in order to clearly illustrate the principles by which we are to be guided in the selection of our stimulants and narcotics.

Every individual is a law unto himself. Just as no human face is precisely like any other, just so no constitution is precisely like any other in its adaptability for special articles of food or drink.

There are those who, on account of the terrible evils of intoxication, desire to abstain entirely from all alcoholic liquors. This is a matter of conscience, with which science has nothing to do. In this luxurious age, all proper encouragement should be given to the spirit of self-sacrifice for the good of others; but we must all admit that those who do thus abstain, no matter how conscientiously, are very apt to do unintentional harm; and, in the words of Hudibras, to

> "Compound for sins they are inclined to,
> By damning those they have no mind to."

I have known scores of active, earnest, and conscientious reformers in the temperance movement, who would pluck out a right eye or give their right hand to be burned rather than touch a drop of fermented or distilled liquors, who yet are grossly and criminally intemperate in the use of tea, of coffee, and tobacco, all of which contain poisonous active principles, while the latter contains *nicotine* and nicotianin, in comparison with which the fiercest alcoholic liquors are mild and innocuous.

Indeed it may be *said in general that the nervous brain-workers of our modern civilization*—our educated classes—are, at the present time, less injured by alcoholic liquors than by tobacco, opium, tea and coffee.

Throughout the land there are thousands of nervous and feeble and dyspeptic men, and especially women, and who, through the habitual use of tea and coffee, are growing more nervous, more feeble, more dyspeptic, who by abstaining from these articles, or by using them in greater moderation, or by wisely substituting for them some pure and healthful wines, beers, or ciders, might vastly improve their own constitutions, and those of their children and children's children.

The only consistent teetotalism is that which abstains from all forms of stimulants and narcotics. The only consistent prohibitory law is that which should prevent the production, the importation, or the sale of tea, or coffee, or tobacco or alcoholic liquors, or opium.

Such absolute teetotalism is very rarely seen among the adult population. In the whole circle of my personal acquaintances, extending through all ranks and grades of society, *I cannot now recall the names of a dozen consistent adult teetotallers.*

Such a consistent prohibitory law has not to my knowledge ever been *proposed or suggested* during all these fierce contests on the subject of temperance. If proposed, it could never be enacted; if enacted, no earthly power could enforce it for one day. The great fault of the noble heroes, who in spite of their ignorance and errors have so successfully engineered the temperance reform, is that they have taken *too narrow* a view of the question—have combated some *one* form of stimulant or narcotic, as alcohol, or tobacco, or opium, ignoring the rest. In this way they drive the disease from one part of the body to another, but do not thoroughly eradicate it.

To prohibit stimulants and narcotics from our modern civilization would be as morally impossible as it would be to prohibit the use of beef or bread or fruit. They are woven into and have become a part and parcel of modern society, and will probably continue to be so until that society shall perish from the face of the earth.

But in the next generation they will be used very differently from what they are now. With the progress of civilization and the consequent change in the type of constitution, we must instinctively change our habits in the use of stimulants and narcotics, just as we have done and are doing in the use of our ordinary food. The probabilities are that in the next century our brain-workers, at least in this climate, will use *less* strong tea, *less* coffee, *less* tobacco, and more beers, wines, and cider. Intoxication and intemperance will not necessarily increase with the increased consumption of stimulants and narcotics. *Three centuries ago intoxication, on the average, was far more gross and flagrant than it is now; and yet during these three centuries the use of stimulants and narcotics has increased several fold more rapidly than the population.*

It is the same with licentiousness. It is a great evil now; but it was a far greater evil three centuries ago. Both of these giant woes have diminished with the intellectual and moral elevation of mankind. If savage nations could have access to the immense variety of stimulants and narcotics that are found among the civilized, they would be as beastly in their intemperance as they proverbially are in their licentiousness.

In these latter days intoxication has *decreased because knowledge has increased.* The same law will be observed in the future. In proportion as mankind become intellectually and morally enlightened, in that proportion will they become temperate, however freely they may be provided with the different varieties of stimulants and narcotics. As long as ignorance and extreme poverty exist among men, just so long will there be intoxication and all forms of intemperance.

The foundations of Temperance, as of every other virtue, must be laid on these *four* great corner-stones—the *Family*, the *School*, the *Church*, and the *Press*.

AIR.

Common air is a mixture of four different kinds of matter, all of which sustain vital relations to organized existence. These substances are oxygen and nitrogen, watery vapor and carbonic acid. The two latter exist only in very small quantities. Of these substances, oxygen is of the most importance, and the one which is the most essential to life. Although it constitutes but about one-fifth of the ordinary dry atmosphere, yet it is the only part that is absolutely *indispensable* to existence. It is the oxygen of the air that supplies the lungs in respiration, and that excites combustion. Without it we could not produce light nor heat from any combustible substance, nor could animal life be supported for a moment. Nitrogen is purely negative in its character, and is merely designed to dilute the oxygen, so that the life of man and of all animals may not be consumed too rapidly, and that combustion may not be too fierce and ungovernable.

The carbonic acid of the atmosphere is to the life of plants what oxygen is to the life of animals. To animal life it is a deadly poison; to vegetative growths it is necessary food. Plants breathe just as animals do, only they reverse the process, and inhale carbonic acid and give off oxygen. Plants are therefore the great conserving forces of nature; they give off oxygen, that is essential to animal life, and breathe the carbonic acid that animals exhale, and which, if it were not thus consumed, would accumulate in such large quantities as to be fatal.

Every leaf of every species of tree on the face of the earth is covered with little pores that are continually sucking in carbonic acid from the air. The estimate has been made that " a common lilac-tree, with a million of leaves, has about four hundred thousand millions of pores at work sucking in carbonic acid; and on a single oak-tree as many as seven millions of leaves have been counted."

During night-time plants reverse the process of the day, giving off carbonic acid and inhaling oxygen, and thus compensate for their great advantage over animals in point of numbers.

A moderate degree of moisture in the atmosphere is also essential to the healthy existence of both vegetable and animal life. The animal breathes in watery vapor, and thus helps to retain the normal moisture of the body. The plants give off watery vapor from their leaves, and, were the air absolutely dry, this process would go on too rapidly, and the nice balance between the solids and fluids would be disturbed. The watery vapor also descends at night in the form of dew on the thirsty plants, and when accumulated in large quantities falls in showers. The rain, in its passage through the air, clears it of many substances floating in it that are unwholesome for respiration.

Our atmosphere is liable to become poisoned in a thousand different ways. From decaying vegetable matter, from the stagnant pools in swamps and filthy cities, from the vile garbage of the streets, from the breath and bodily exhalations of man and of all animals, from the combustion of oil, gas, wood and coal in the ordinary modes of illumination and heat—from all these, and from many other sources, the air is continually becoming poisoned with substances that are harmful, and, in sufficient quantities, fatal to existence.

This universal agent that surrounds our globe to a depth of fifty or a hundred miles; that is so essential to animal and vegetative life, that if it were taken away for a moment, the world would be left devoid of organic or inorganic existence; that is continually becoming laden with poisons, not only from animal and vegetable decomposition, but, worse than all, from animal breath and exhalations, and by the very means of light and warmth that add such a charm to civilization, ought *surely* to be thoroughly studied and understood in all its manifold relations by those who wish to follow the best methods of hygiene.

Brain-workers of all classes especially need to study the art of breathing. Amid the rush and whirl of our nervous civilization we are often in danger of starving, not for want of food, but for want of *oxygen.* To breathe well and plentifully, under our artificial system of life, requires special study and attention, just as much as it does to eat well and abundantly.

In order to breathe well there is need of good lungs and a general vigorous condition. This can only be maintained by activity of mind as well as of body, by resting the faculties through variations of employment, by abundance of sleep and food, superadded to a faithful and joyous cultivation of the moral nature.

In order to breathe well it is necessary to take more or less active physical exercise in the open air. In entire repose a man of average size inhales about 20 cubic inches of air with each inspiration, and at the same time gives off from his lungs considerable watery vapor and carbonic acid. In walking, running, sleeping, or in any kind of labor or play, there is an increase both of the air inhaled and of the substances given off from the lungs, proportioned to the severity of the exercise. Walking, especially with an object in view, and in pleasant company, is one of the very best modes of exercise for brain-workers, because it allows of the full and free expansion of the lungs.

It has been computed by an accurate observer that an ordinary gas jet, when in full operation, vitiates as much air as eight human beings. This accounts for the much greater oppression that is felt after an evening's entertainment, than after an attendance upon an equally crowded gathering in the same place in the daytime.

But sermons on ventilation are becoming old stories now, and I can add little to what every intelligent member of society knows perfectly well. And yet most of our private houses, sleeping apartments and all, are badly aired. And as for public halls, there is scarcely one in the country that in respect to ventilation is adapted for the abode of more than an average-sized family, although hundreds and even thousands nightly crowd them.

If many people are confined in one apartment, with fires, and a great number of lighted candles or lamps, without due ventilation, the air soon becomes unwholesome and unfit for respiration; hence delicate persons are very apt to faint or become sick in crowded assemblies of any kind, or in any place where the air is injured, not only by the breath of many persons, but by fires, candles, &c.

The air of cities and large towns, where a great variety of manufactures are carried on, with a crowded population, is not only breathed over and over again, but is also loaded with exhalations, besides the effluvia constantly arising from slaughter-houses, privies, dunghills, and common sewers. To prevent the air from being thus injured, police-officers should take due care that the streets be *daily* cleared of all filth and rubbish; that the offal from slaughtering-houses be not suffered to accumulate; and that the common drains and sewers be frequently opened and kept clear from obstructions.

Burial-grounds in populous cities are a nuisance.

Air is sure to become corrupted and unwholesome wherever it stagnates long; hence the low, dirty, and close habitations of the poor, as well as jails, prisons, workhouses, and hospitals, where the strictest attention is not paid to ventilation and cleanliness, and a number of persons are crowded together, may be considered as lurking-places in which typhus and other malignant fevers are likely to be generated, and are frequently communicated to those who visit them, or are within the sphere of their influence.

No house can be wholesome where the air has not a free passage through it. Houses ought to be daily ventilated by admitting a current of fresh air into every apartment. Instead of making up the beds as soon almost as people rise from them, the different coverings ought to be turned down, or be wholly taken off, exposing them for some time to the fresh air.

In jails, hospitals, ships, &c., where this process cannot be gone through, the foul air may be expelled, and fresh air introduced by means of ventilators. In all places where numbers of people are crowded together, a strict attention ought to be paid to cleanliness and a free ventilation.

If fresh air is necessary for those in health, it is still more so for the sick. To them it is the most reviving of all cordials, if admitted into their chamber gradually. Where the sick are laboring under fevers of the typhus and malignant kind, dysenteries, or other diseases of an infectious nature, we cannot pay too great attention to a free ventilation, both for the benefit of the sick and their attendants.

The air of large cities or great towns should be avoided as much as possible by persons in a delicate state; particularly by the consumptive, asthmatic, hypochondriac, and nervous. When unavoidably obliged to remain in the like situations, such persons should go as often as they can into the open air, and keep their houses properly ventilated.

Many are afraid of *night air.* Florence Nightingale replies to this objection by asking, What can we breathe at night except the night air?

Her rule in regard to ventilation of sick-rooms was to "*keep the air which the patient breathes as pure as the external air, without chilling him.*"

If this rule were acted upon, many of our fevers and other diseases would lose much of their terror.

Patients suffering from typhoid fever have been treated successfully *without medicine, by removing them out-doors, under tents.*

Houses surrounded with plantations or thick woods, and those situated in low marshy soils, or near large ponds or lakes of stagnated water, are always unhealthy.

When the weather becomes warm, the muscular fibres are relaxed. When it is cold, they are rigid and contracted, and the power of cohesion is increased, so as to affect even the hardest metals.

The weight of air which our bodies sustain at different seasons is very great. That which presses on the body when the mercury is highest in the barometer is said to be equal to 39,900 pounds troy weight, and, even under the least degree of pressure from the air, is thought to be equal to 39,820 pounds troy. As the body must sustain so immense and variable a weight, we cannot be surprised that our health should become affected by the changes of the weather, and that frequently in a sudden manner. Air is so closely connected with health and life, that it is impossible for the animal functions to be properly carried on, even by the most vigorous and athletic constitutions, where a due attention to it is treated with indifference or neglect.

METHODS OF VENTILATION.

The first and simplest method of admitting pure air into a room is by *opening the window.*

Letting down the window from the top and putting it up from the bottom, and having an open fire-place, give the foul air a chance to escape and allow the pure air to enter. The foul warm air always rises, and will pass out at the top, while the cool air enters from without. If the window is guarded by shades or blinds, *air can be admitted in this way without causing any unpleasant or dangerous current, both by night and by day.*

A little management and study will enable any one to keep their bed and sitting-room well ventilated in this manner, without exposing even the invalid to the risk of taking cold. But *management and care* cost time and patience, and the majority of people are not willing to pay so high a price.

2. *Houses may be ventilated by constructing them so that the foul air can be expelled through the flues.*

Dr. John H. Griscom, so long and so favorably known to the country as a writer on Hygiene, and as a conspicuous leader in sanitary reform, has introduced a system of *heated* flues through which the foul air is expelled. He claims, that

"*To secure a high temperature within a ventilating flue, and to be able to multiply heated flues, are the considerations demanded for the thorough and efficient ventilation of all ordinary buildings.*"

He also claims that by his method "*sufficient, reliable, and perfectly controllable* ventilation can be secured in dwellings, school-houses, churches, court-houses, stores, and all edifices which are *warmed by hot-air furnaces* of any description. It costs but little, and it can be maintained without expense."

From a "*Report on the Importance and Economy of Sanitary Measures to Cities*," by John Bell, M.D., I extract the following description of Dr. Griscom's method of ventilation:

"It pertains to the 'chemical method,' the motive power of the air being heat, but requiring no extra expenditure of fuel; the heat used for the purpose being only the waste heat of the furnace by which the house is warmed. The arrangement consists in the construction of independent ventilating flues in the walls of the house, in proximity to the hot-air tubes, so that the two may be connected together by means of a lateral or branch tube, by which a current of hot air may, at any desired moment, be transmitted from the hot-air tube to the ventilating flue. By this means the ventilating flues, which terminate in the open air like an ordinary chimney, will be warmed by the hot air from the furnace when the ordinary hot-air register is closed, as at night in a dwelling, or in a school-house after school hours.

"If properly constructed as to shape and material, the walls of a flue will, after a current of hot air has passed through it a short time, become sufficiently heated to rarefy the air within; thus giving the flue a good ventilating power, even after the current of hot air has been withdrawn. For example, if the hot-air register of a parlor be closed at ten o'clock at night, and the heat, instead of being thrown back into the furnace, is allowed to pass through the lateral tube into the ventilating flue, and so continue till six the next morning, it is evident that, during those eight hours, the interior of the ventilating flue must become thoroughly heated, so that the next day, when the current of hot air is restored to the parlor, the heated sides of the ventilating flue will continue to rarefy the air within them for many hours, and perhaps even days, afterward.

"There being no danger of a reaction of the air of the flue through the ventilating register (as is the case when ventilating openings are made in ordinary fire-flues), connections with the apartment to be ventilated may be made at any point, and even carried to the opposite side of the house, between the beams of the ceiling, to ventilate distant apartments. Dr. Griscom's method has the advantage of being applicable to all edifices warmed by hot-air furnaces of any description, which, in general, are those most needing ventilation. This arrangement may be introduced into many houses already erected, by connecting the hot-air tubes with such of the ordinary chimney-flues as are not used with fire.

"One of the principal advantages appertaining to this plan is the capability of having a LARGE NUMBER of ventilating flues put in connection with the furnace. In fact, the number may correspond with the number of hot-air registers, and thus any desirable amount and extent of ventilation be obtained."

In addition to the advantages enumerated in the foregoing extract is that of avoiding the danger of fire, incurred by overheating the hot-air tubes when the registers are closed, as the hot air then passes up through the ventilating shaft, instead of being confined below."

Dr. Griscom's method does not admit pure air from without; it simply allows the foul air free exit.

3. The admission of pure air from without is accomplished by the *Ventilator of John Lesperance.* This invention is just now being brought to the public attention as this book is going through the press. The ventilator is so arranged that it can be placed in the window as a substitute for a pane of glass.

Among the advantages claimed for it in the report of the Special Committee of the *New York Association for the Advancement of Science and Art*, are:

"The object of this ventilator is *sevenfold.*

"1st. That air shall be admitted at all times!

"2d. That its course shall be inwards and upwards, transversely, not horizontally.

"3d. That the air shall be divided into numerous streams, so as to make it equally divisible into every part of the place to be ventilated.

"4th. That no suspended organized matter shall pass in with the air.

"5th. That the air in passing through the ventilator be deprived of its carbonic acid and sulphuretted hydrogen gases, the two gases most generally found to predominate in impure air, and most dangerous to animal life.

"6th. That when the air is overcharged with aqueous vapor, a portion of it can be absorbed in the ventilator.

"7th. That the admission of the air will produce no sensible draught.

"Your Committee, after careful examination and mature deliberation, are convinced that the Lesperance Ventilator will perform all that the inventor proposes it should do, and we hail with great satisfaction this addition to science and art, considering that it will be found one of the best means for the preservation of health, and its restoration to diseased bodies, especially in hospitals."

"An adult man in ordinary work gives off in 24 hours from 12 to 16 cubic feet of carbonic acid gas, and also emits an indeterminable quantity of the same gas by the skin. In hospitals, in addition to being vitiated by respiration, the air of the sick-rooms is also contaminated by the abundant exhalations from the bodies and by the effluvia from discharged excretions.

"That the breathing of air rendered impure from any cause is hurtful, and that the highest degree of health is only possible where to other favorable conditions, is added that of a proper supply of pure air, might be inferred from physiological evidence of the paramount importance of proper aëration of the blood. Experience strengthens this inference; statistical inquiries on mortality prove beyond a doubt, that of the causes of death which usually are in action, *impurity of the air* is the most important. Indeed, observations confirm this. The air must be removed so immediately that there shall be no risk of a person breathing again his own expired air, or that of another person. In hospitals, especially, it is desirable that there shall be no chance of the air of one sick person passing over the bed of another; therefore the movement of the air should be rather vertical than horizontal; and as the expired air and all the exhalations from the body or bedclothes at first pass upwards from their rarity, it is desirable that they should be discharged above, and not drawn down again, past the patient."

Speaking of ventilation, Mr. Parkes says:

"In order to keep air in its necessary purity it must be continually changing. Whatever way the air is supplied, certain conditions must be laid down: the air which enters must itself be pure, its movements must be *imperceptible*, otherwise it will cause the sensation of draught and will chill. It must be well diffused all through the room, so that in every part movement shall be going on; in other words, the distribution must be perfect. A moving body of air sets in motion all air in its vicinity; it drives air before it, and at the same time causes a partial *vacuum* on either side of its own path, towards which all air in the vicinity flows, at angles more or less approaching right angles."

Mr. Parkes gives a description of the many modes invented for the transmission of pure air into buildings, but does not seem to have much confidence in any of them. Some of them are clumsy and useless, and many very expensive. Amongst the many are drilling holes in the panes of glass; having two panes, the outside open in the bottom, the inside in the top, the air to pass between the two panes; tubes passing into the room and perforated; air passing round hot steam pipes; pieces of board constructed in the upper part of the window, to direct the air inwards and upwards; fine wire screens, &c., &c., &c.

ACTION OF THIS VENTILATOR.

The ventilator is thus described in the inventor's own words:—

"As the air in my ventilator has to pass through three plates of perforated tin, a covering of sponge, and a box filled with charcoal, it is impossible that any suspended organic matter can pass through it, and, when necessary, a portion of damp in the air is absorbed and retained in the sponge in the first chamber, and all impure gas is absorbed by the charcoal in the second chamber. The air is rendered warm, *first*, by the amount of friction it has to undergo; *secondly*, by being deprived of its watery vapor; and *thirdly*, by the chambers through which it passes being warmed by the heat of the room."

DESCRIPTION AND EFFECT.

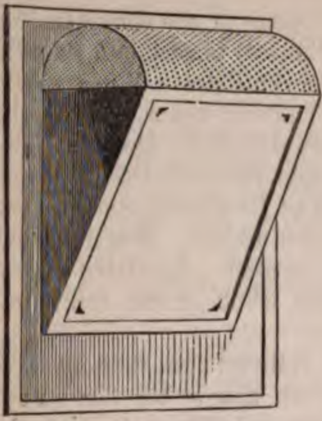
"From the formation of the ventilator, the air passes upwards and inwards, *vertically* and not *horizontally;* therefore there can be no sensible draught; and as it passes through three plates of perforated tin, it is divided into numerous streams, and is discharged into the room, like water from a fine rose on a watering-pot, in continuous streams. It may be objected that my theory, although good when there is an abundance of wind, would not prove equally so when there is little or no wind stirring; but where the wind is said to be still, it travels at the rate of one mile and one-half per hour. Even then there is a stream of pure air admitted, being drawn in by the heat of the chamber or house to be ventilated, on the principle that heat draws the current of air towards it. This fact every one knows by observing in winter, when he opens the small pane of glass (called a ventilator) in his window. It is the cold air that rushes in, not the hot air that rushes out. Of course, if a double current is established, the hot air will rush out as it is displaced by the cold. Ventilation, however, should be on every side of a house, but even when it is not, there will always be a current of air through the ventilator."

MANNER OF USING THE VENTILATOR.

"In every private house there should be one large or two small ventilators in every large room, particularly in bedrooms. In hospitals, barracks, schools, prisons, &c., there should be one large or two small ones for every twelve persons in the daytime, and in the sleeping-rooms, one for every eight persons sleeping therein. In prisons, one large ventilator should be in each cell. The ventilator should take the place of one of the highest panes of glass in the window, care being taken that no obstruction is allowed to prevent the easy withdrawal of the box of the ventilator; when necessary to do so, to dust it once every day. The box of the ventilator will of course face the inside of the room. Where double windows are used, the tunnel takes the place of the corresponding pane of glass to that in which the ventilator is placed, and the tunnel drawn out to cover the mouth of the ventilator. When necessary to deprive the air of part of the aqueous vapor (damp), the sponge must be placed in the vacant chamber under the box; and should the wind blow very strong and cold, direct on the mouth of the ventilator the piece of red flannel must be placed over the top of the box. At other times it hangs down useless. When the air is not over wet, the sponge should not be used. As stated above, the box of the ventilator, as well as the whole of the ventilator, should be dusted daily.

"When the ventilators are used for railroad cars, they must be in the cars. Their size will depend upon that of the car. Four ventilators, *one* facing *each end* and *one* on *each side*, as shown in the model, will be sufficient. It will be at once seen that only two ventilators admit air at the same time. The tubes for the escape of foul air generated in the cars *must be below* the ventilator, otherwise the fresh air, as well as the foul air, would pass through, and the object intended to be obtained would be lost. By my plan the fresh air displaces the foul air, and forces it out through a perpendicular tube eight inches in diameter, placed in each corner of the car; these tubes are carried through the top of the car, and are mounted with a cowl turning on a pivot, to prevent the wind blowing down. Into each of these perpendicular tubes six horizontal tubes, 4-inches in diameter, enter, as shown in the model. This gives 24 inch tubes to carry off the foul air, which is certainly sufficient for sixty persons.

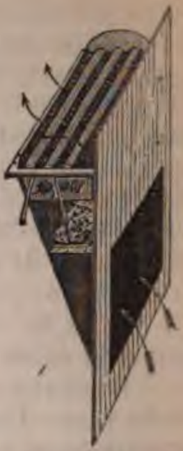
"When the cars are in motion, only two of the ventilators are in actual use, namely, the one in front, and the one in the side with the funnel towards the locomotive; the keys of the other two should be turned. The sponge should be always in use on railroad cars, but the piece of flannel will not be necessary. If the wind blows very strong and cold, the keys may be used to regulate the admission of the fresh air. Every builder of a car may arrange these ventilators to suit his own taste; he may beautify them and make them as expensive as he pleases, but in all cases *the principle* must be adhered to, *i. e.*, the ventilators must be *inside* the car. as high up as it is possible to place them, and the escape tubes must be *below* the ventilators, yet not as low as the heads of the persons sitting in the cars."



LESPERANCE VENTILATOR.

External view.

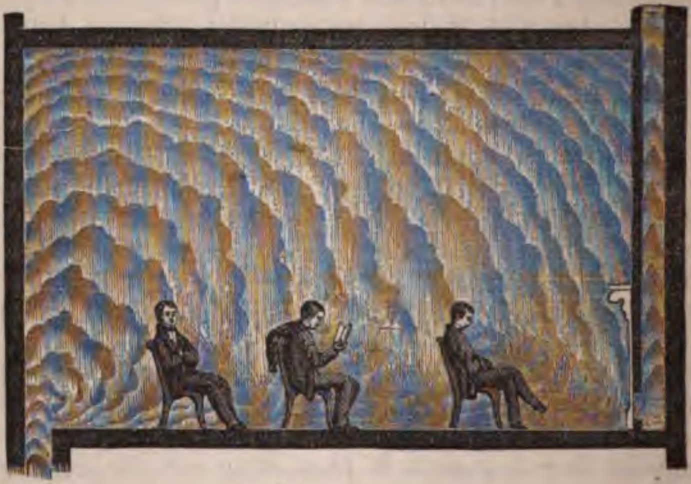
This Ventilator may take the place of a pane of glass.



LESPERANCE VENTILATOR.

Interior view.

The arrows indicate the direction of the air, through the charcoal and wire gauze, into the room.



CIRCULATION OF AIR IN ROOM.

Advantage of fireplace illustrated. The warm air, being lighter, rises to the top of the room, and the cold air falls to the bottom.

(From Leeds' work on Ventilation.)

ADVANTAGES.

"In conclusion, I have no hesitation in stating that I find from experience that the ventilator, placed in any building according to the directions given, will ventilate the building with fresh pure air without producing any sensible *draught;* and as the same principle is applied in the adaption of it to railroad cars, if it is used in the manner pointed out, and as shown in the model, the car will be thoroughly ventilated without any sensible draught."

EFFECTS OF ANTHRACITE COAL ON THE HEALTH.

Nearly all nervous persons who have lived much in close rooms heated by coal have observed a feeling of depression, headache, or other unpleasant symptoms, which they have attributed to the stove or furnace.

Recent experiments have shown that *carbonic oxide* escapes from our stoves, as ordinarily manufactured. It is claimed that this *carbonic oxide* is exceedingly deleterious to the health. It is even asserted that there is among us a *separate, special disease* caused by this poison.

It was once supposed, and is now the general belief, that these unpleasant sensations are the result of *the dryness of the air.* But according to the experiments of Dr. George Derby, of Boston, who has written an excellent treatise on "*Anthracite and Health,*" this opinion is erroneous. He contends that "*iron heated to any point possible in our furnaces has no power to abstract moisture from the air.*"

He contends, furthermore, and with a great array of evidence, that *dry air* is healthier than *moist air.* His conclusion is, that "*no artificial evaporation whatever is required on the score of health.*"

General Morin, of France, has made elaborate experiments, which go to show most clearly that *carbonic oxide* escapes from our cast-iron stoves and diffuses itself through the atmosphere. His view is, that the headaches and general uneasiness and distress that we so often experience when confined in rooms heated by cast-iron or sheet-iron stoves are caused by the presence in the air of this *carbonic oxide.*

His experiments consisted in chemical examination of the air around the heated stoves.

The remedy proposed is to make furnaces "*of wrought-iron plates riveted together tightly, as those of a steam-boiler, so that the whole apparatus shall be practically of one piece.*"

LOCATION OF HOUSES.

Whatever may be the temperature of the climate, the air, generally, may be considered healthy, if pure and clear, and occasionally visited with the agitating and renovating power of the wind. On the other hand, an air that is gross, or strongly saturated with animal, vegetable, or mineral substances, is highly injurious to all.

In the selection of a residence with a view to health, preference should always be given to an elevated situation, which is neither exposed to extreme heat in summer, nor to piercing cold in winter. The rooms should be lofty, and of suitable dimensions. Low, confined ones are injurious. (See views of Dr. Bowditch under *Consumption.*)

The air of any place is salubrious where the water is good, and where this is pure and tasteless, the air, in general, is free from any offensive smell. Where sugar readily enters into a dissolved state spontaneously, the walls of the house are stained and changed in color, the papering loose and detached, and metals acquire rust or verdigris on their surface; these are presumptive evidences that the situation is damp, and therefore unwholesome.

The higher parts of a house are generally the most healthy. All the rooms in a house should be daily ventilated by the seasonable admission of air for a sufficient length of time.

By immoderate warmth, either in sitting-rooms or sleeping apartments, with doors and windows made what is called air-tight, the body will become enervated. To avoid indisposition from this cause, it may be stated as a general maxim, that the temperature of a sitting-room should not exceed 60 degrees of Fahrenheit's thermometer, nor that of the bedroom 50.

As the warmer weather is progressively succeeded by a state of greater cold, we should inure ourselves to the effects of these changes. By these means, if we use moderate exercise, and are properly clothed, we shall neither feel the cold unpleasant, nor will it cause any obstruction of the necessary perspiration.

MUSCULAR EXERCISE AND RECREATION.

About thirty years ago the attention of physicians and of society in general, was called to the fact that new forms and phases of nervous diseases were arising, and that old and familiar nervous symptoms that had been quite rare were increasing in frequency.

It was found that neuralgia—a name hardly mentioned in the earlier part of the present century—was becoming popularized in nearly every household; that dyspepsia, instead of being an occasional and exceptional malady, was rapidly becoming fashionable, especially in the circles of the wealthy and cultivated; and that hysteria and hypochondria--maladies of dark and ugly significance—were spreading through all ranks and classes, like some mysterious contagion. At the same time, it began to be observed that inflammatory diseases were rather less frequent and less violent. About the same time also—partly on account of the manifest changes in the type of disease, and partly as a result of a better knowledge on the part of the profession—a revolution began to be wrought in the treatment of disease. *Bleeding and calomel gave way to tonics and stimulants.* About this same time also a number of well-known writers began to publish works on the laws of health, in which literary men especially were exhorted to *exercise* furiously in order to work off and cure the nervous diseases to which they were liable. The cure for the physical maladies of the human race was to be found not in taking away the little blood that remained in the exhausted invalid, or in confining him in a dark room on a starving diet, but in long walks before breakfast, in climbing high mountains, in protracted rides on horseback, and in furious gymnastic exercises with clubs and dumb-bells. It is always the tendency of ambitious patients to go ahead of what they are advised to do. Tell them to walk one mile a day, and they will walk twain. Tell them to exercise gently a few moments before breakfast, and they will very likely perform violently with dumb-bells, or at the wood pile for an hour, and thus secure far more injury than benefit.

As a result of the teachings of which I have spoken, numerous errors, both in the theory and in the practice of physical exercise, have arisen, not only among the students, but among teachers and professors—errors that are of a serious character and of which they will in time become convinced by experience, even though no one should attempt to point them out.

1. *It is an error to suppose that we need great muscular strength.* Long ago the philosopher Seneca wrote that a scholar should not pride himself on length of arm or breadth of back. This remark of the old philosopher was unconsciously based on sound physiological principles.

I desire that my precise meaning on this subject should be clearly understood. All classes need a certain amount of muscular exertion, and should make it a duty and a pleasure to engage every day in some exercise that will call the muscles into vigorous activity.

But the increase of the size of the muscles should not be the *leading aim* in the exercise of students. It is well and necessary that we should obtain a good muscular development, but it should be an incidental and unconscious result of our exercise rather than its special distinct object. We should not in our exercise be all the time on the watch, as to whether our muscles are growing firmer and larger. When we seek to develop the intellect, we do not stop each moment in the midst of our studies to measure our heads to see how the brain grows; no more should we stop in the midst of our exercises to see how our muscles are developing. The best way to develop the brain is to regularly pursue a variety of studies adapted to our tastes, and let the growth take care of itself. Just so, the best way to develop the muscles is to regularly pursue a variety of exercises, adapted to our tastes, and let the muscles grow or not as they choose.

Again I say that muscle is not always health. A man may have fearful flexors and extensors, may be the champion at the dumb-bells and on the race crew, and yet have a weak nervous system and be utterly incapable of protracted study or thought. The worst cases of nervous exhaustion that I meet with in my practice are oftentimes in men of large frames and powerful muscles.

2. *It is an error to suppose that gymnastics, or bowling, or billiards, or ten-pins, or any form of in-door exercise, can compensate for the lack of out-door air and sunlight.* These three—air, exercise, and sunlight—are all great physicians, but the greatest of them is not exercise, but air. Sunlight itself is a more potent healer than mere muscular exercise. A passive life in the open air is more healthful than an active life under cover. In the severest weather, and when time is limited, it is convenient to resort to the exercises of the gymnasium, the bowling-alley, or the billiard-room, and yet we are all of us too much afraid of stormy weather. The worst seasons for walking are not in the midst of a storm, but just *before* a storm is coming on. For twenty-four hours or more before a north-east storm reaches us the atmosphere is usually in a bad electric condition. (See *Atmospheric Electricity*.) This fact has been long and painfully known to nervous invalids, and has recently been confirmed by careful observations with the electrometer both in this country and in Europe. On the other hand, while the storm is actually raging about us the atmosphere is frequently in a good electric condition. The depressing heat of summer is the only atmospheric condition which, in our climate, ought to prevent us from exercising in the open air. Air and sunlight are the best remedies we know of for consumption and general nervous debility. Sunlight

possesses mysterious and subtle chemical virtues that give it a great power over the nervous system. Our first choice of exercise should therefore be those methods which, like walking, climbing hills and mountains, and out-door games, can be taken in the open sky and under direct exposure to the solar ray.

3. *It is an error for sedentary or feeble persons to take very violent or exhausting exercise of any kind.* For a brain-worker to attempt to concentrate a large amount of severe exercise in the shortest possible time, is unphysiological and absurd. Therefore straining at heavy dumb-bells, protracted running, and especially the so-called "spouting" of boat-racing, are to be unsparingly condemned.

A few years since Dr. Winship excited not a little attention by his wonderful feats at lifting heavy weights. The influence that his example has exercised, even among the intelligent classes, is another historical illustration of the great injury that even a weak and ignorant man may accomplish who sincerely believes his own errors. Even if the chief object of college education were to train up a race of pugilists, the system of Winship would not be a good method of accomplishing it.

Boating is a method of exercise that has many advantages. It is pleasant, congenial to the tastes of a large number, sufficiently active, and must be pursued in the open air.

In our country, boat-racing is of such recent date that we have not yet had opportunity of testing its special effects on the heart, on the general health, or on longevity.

4. *It is an error to make exercise a duty rather than a pleasure.* "Of all remedies for the nerves," says Jean Paul Richter, "enjoyment is the most powerful." As a rule, food which is best enjoyed is best digested. Just so exercise which is most agreeable is usually the most beneficial. In selecting methods of exercise, every individual should be guided by his own individual tastes. It is better to change frequently from one form of exercise to another. It is well even to consult our whims and our varying moods. Above all things we should strive to prevent our exercise from becoming a dry, hard, mechanical routine. The heart should go with the muscles. Those who are constitutionally nimble and athletic enjoy gymnastic exercises, and within certain limits are benefited by them; while those who are feeble, nervous, and awkward positively dislike them, and should by preference select amusements in the open air. The delicate and nervous should remember that excessive exercise must weaken rather than strengthen them, especially if it be uncongenial. Let such always leave off before they are exhausted. Let them not confine themselves to any one method or system, but ring

the changes on all, as their fancy may direct, and when they are too wearied for active exertion, let them, by an easy stroll under the open sky, seek the beneficent and grateful aid of the two greatest of physicians—*Air* and *Sunlight.*

5. *It is an error to neglect all exercise.*—To some it may appear strange that I have not placed this first in my catalogue of errors; but in these days there are, I hope, very few who need exhortation to the *general* duty of physical exercise. I have rather assumed that all my readers were conscious of that duty as they were conscious of the duty of virtue, and needed only suggestions and guidance, so that they might best use without abusing the rich variety of exercise of which in these days they are now availing themselves.

Best Times for Exercise.—It is better, so far as possible, to take our exercise in the daytime than at night. At night the electric condition of the atmosphere is not usually so favorable as in the greater portion of the day. Then again, those who exercise after dark lose the healthful influence of sunlight. The evening—just before the hour of retiring—is a good time for light gymnastics, for those whose duties are so pressing that they cannot devote a portion of the daylight to out-door exercise. The general rule should be to take out-door exercise in the daytime, and in-door games and gymnastics in the evening.

Except in the hottest weather, the middle of the afternoon is the best portion of the day for exercise for students and literary men.—This is, as has been said, a bad time for study, and for that reason it is well to improve it for the purpose of physical recreation.

The forenoon—between nine and one—would be the best time for exercise of the muscles, as it is for activity of the brain, if the object of life were to make pugilists and athletes, but those who desire to make the most of intellectual culture should devote the best part of the day to study. Physical exercise for students is a means and not an end, and should, with occasional exceptions, be taken at the times when we are least fitted for study.

The worst time for exercise is early in the morning, and before breakfast.—The errors that prevail on the subject of early morning exercise are simply monstrous. Even the strong and athletic are liable to injure themselves, by exercising long and vigorously in the early morning on an empty stomach; while the delicate, the dyspeptic, and the nervous should not allow themselves to indulge in any sustained activity of brain or muscles until the system has been fortified by at least a preliminary breakfast. *Farmers sometimes injure themselves by working too hard and too long before breakfast.*

Moderate exercise, such as walking, the lighter forms of gymnasties and easy games, can be taken indiscriminately just before or just after meals, without injury; but the severer tasks—rowing, active games—should usually be reserved for the middle of the forenoon or afternoon, or for the evening. It is not well to go to our meals in a condition of exhaustion, either of the brain or of the muscles. It is not well to be over-fastidious about exercising just after meals, for our own feelings will usually guide us aright. After a hearty meal we do not care to plunge into the severest work.

Quantity of Exercise.—It is as impossible to give mathematical rules for the amount of muscular exercise to be taken, or for the time that it should occupy, as it is to prescribe the weight of food we should take, or the number of hours of sleep we should indulge in. The question of time and quantity must be settled by the tastes, the constitution, and the experience of each individual. There is one general rule by which we may all be guided—and that is, to stop short of exhaustion.

Riding Velocipedes.—It is proper that I should here speak of a form of exercise that is now exceedingly popular—*riding velocipedes.* This is about the only method of exercise of which I cannot speak from extended personal experience. My impressions are decidedly in its favor. It seems to me, judging from the few trials I have made, from observation of the subject in the public rinks, and from inquiries of those who are masters of the art, that it may appropriately be compared with skating, which, as we all know, is a most excellent form of active exercise.

Like skating, it requires practice in the art of balancing. Like skating, it is attended with the exhilaration of rapid movement. Like skating, it can be taken in the open air. Like skating, it pleasantly exercises the whole system, and at the same time, unconsciously to ourselves, it sufficiently develops the muscles. Like skating, also, it is sometimes attended with unpleasant and even serious accidents. The fact that occasional ruptures or bruises result from skating or riding velocipedes, ought not, I think, to lead us to indiscriminately condemn these amusements. Accidents and injuries—even of a serious character—are liable to occur from nearly all forms of active exercise—gymnastics, bowling, and foot-ball.

Riding velocipedes has this advantage over skating, that it can be taken at all seasons of the year. If it is to become a permanent amusement in the country, the rinks should be so constructed that they may be both open to the sunbeams and protected from storms.

In every stage and state of life, exercise is necessary for our welfare and health; and it is equally requisite for the female as for the male. By food our bodies may be nourished; but if not assist ed, by due exercise, to carry on digestion with advantage, and to help in throwing off the superfluous humors by perspiration, we must unavoidably feel all the inconvenience of repletion and fulness in the blood-vessels, while, at the same time, the body will be afflicted with many painful diseases.

Indolence, moreover, not only occasions diseases, and renders men useless to society, but promotes all manner of vice. Indolence, when indulged, gains ground, and at length becomes agreeable. Hence, many who were fond of exercise in the early part of life become somewhat averse to it when more advanced in years. Idleness may well be said to be the root of many evils. On the contrary, a life of activity and industry of brain and of muscles is not only the greatest promoter, as well as preservative of health, but likewise the best guardian of virtue.

The tendency with many of our farmers, laborers, and mechanics is to use their *muscles too much* and their *brains too little.* They should devote their leisure every day to literature, to history, and to popular science. The world is now filled with books that are *interesting* as well as *instructive.*

The eight-hour law will be a curse to society if it does not tend to increase the amount of brain-work among our laboring population.

Horseback riding, playing croquet, riding velocipedes, skating, rowing, playing base-ball, pitching quoits, foot-ball, walking, running, jumping, gymnastics (Indian clubs, dumb-bells, &c.)—all of these are good methods of exercise. It is well to try them all when opportunity offers, provided we can enjoy them. It is not well to place too exclusive dependence on any one form of exercise. As soon as we get tired of one style of exercise it is well to try another.

I am fully aware that this work will be read by many who labor with *their muscles* all the day, and who need *none of these methods of muscular amusement.* Such persons need to exercise their brains in order to rest their muscles.

Let them read and study in the evening.

(For more detailed remarks on exercise and illustrations see *Gymnastics and Movement Cure.*)

SUNLIGHT.

The effects of sunlight are observed in the animal even more markedly than in the vegetable creation. It has been demonstrated by experiment that animals whose natural color is white will present an entirely different hue and appearance if reared in darkness.

That the development of tadpoles can be retarded by confining them in dark vessels has been sufficiently demonstrated by the experiments of Edwards and Hammond. The fish found in the Mammoth Cave have no sight, because the development of the eyes is arrested by the absence of light. Sir Humphrey Davy in his "Salmonie, or Consolations of Travel," describes the *Proteus Anguinus*, found in the grotto of Madalene, in Illyria, several hundred feet below the surface. He represents them as pale, slender creatures, almost transparent in their natural condition, but gradually becoming of a darker color when they are brought to the light They have no eyes, but in their place two small dots.

Sunlight also penetrates the sea to the distance of several hundred feet, and the fish are as susceptible to its influence as are the animals that move on the earth, or the birds that fly in the air. All the varieties of fish live near the surface of the ocean. All observation shows that even the lower orders cannot live at very great depths. The great majority of fishes move within a few hundred feet of the surface, and only the lower orders are found below 100 fathoms. These facts have been abundantly demonstrated by the investigations of Professors Forbes and Bailey, and Lieut. Brooke.

On man the influence of sunlight is as direct and positive, and far more perceptible than on the lower forms of existence, although he is by nature endowed with greater power of resisting external influences. The merest tyros in hygiene know that children brought up in dark cellars, in gloomy attics, or in any of the dismal corners of a great city, look paler and flabbier than the offspring of the same class of parentage in the country, who, though equally poor, and just as meagrely fed and clothed, are yet allowed the free range of the fields and meadows. Even the children of the better classes in our large villages, who have abundance of nutrition and all the comforts and luxuries of civilized life, are not unfrequently kept pale and thin by forced confinement, until maturer years and emancipation from school discipline allow them opportunity to enjoy the air and the sunlight.

Sunlight discolors the skin in proportion to its intensity, and the length of time to which the body is exposed to its influence. Country people are of a browner cast than the non-laboring classes of the city, although they are not always or necessarily in a better physical or mental condition. Savages who have no abiding place and no permanent shelter from the elements, are of a deeper shade than civilized nations who inhabit the same zone. But among the civilized and the savage it is observed that the parts that are most exposed to the sun—the neck, face, skin, and hands—are darker than the rest of the body, that is mostly covered by some form of garment. In the polar regions, where there is almost perpetual day, either from the direct rays of the sun, or from the reflection of the aurora borealis on the fields of ice and snow, the inhabitants are almost as brown as some races that reside near the tropics.

That the rays of the sun have a distinct chemical effect is proved by a number of special experiments. Pharmaceutical preparations undergo greater or less changes, if the bottles in which they are contained are kept for a length of time exposed to the rays of the sun. "If camphor is kept in a bottle, crystals will be formed on the side of the glass upon which the light falls. If that side is turned from the light the crystals will be gradually removed, and again be deposited on those parts upon which the rays of light first impinge."

It has been ascertained by the experiments of Mr. Hunt, that when the sunlight is transmitted through media of different colors, the growth of plants is variously modified. "Under glasses of an orange, yellow, red, or ruby color, the roots of tulips exhibited some vitality, and in some cases buds appeared. Underneath the green glass the plant grew slowly but strongly. The flower-buds generated under these circumstances never could be made to blossom, notwithstanding the greatest care and attention bestowed upon them."

But the investigations of science have not stopped here. By means of the spectroscope, Professors Bunsen and Kirchhoff have even presumed to analyze the sunlight by the prism, and they have found that it contains various metallic substances, such as iron, nickel, barium, copper, and zinc. They account for the presence of these metals in the rays of the sun by supposing that, in their passage to the earth, they have passed through vapor containing them.

Most of the savage and wandering tribes make their home in the sunlight, and need no instructor; but the child of civilization, who lives beneath the shelter of thick walls, in rooms agreeably warmed and lighted by the skilful appliances of art, should make the enjoyment of the open sky a study and a duty. In these latter days we have made such astonishing advances in the methods of producing artificial warmth and light, that we forget the great natural source of these comforts, and ignore the fact that the sunlight possesses many subtle chemical virtues that are essential to animal or vegetable life, and which exercise a mighty and perpetual influence on the health, the life, the beauty, and the character of humanity, which thus far has not been clearly understood by the genius of science, nor in any way supplied by the resources of modern art.

We act, indeed, as if we were afraid of the sunlight We not only fly from its presence under cover of high, dark walls, but we close our doors, darken our windows with gloomy blinds and thick shades, as if it were our enemy and were perpetually besieging our houses, in order to force an entrance and destroy us by some terrible plague. No walled town, surrounded by armed foes, was ever so vigilantly and perseveringly defended as our own modern homes against the invasion of sunlight. Into the majority of our city dwellings and churches the sunlight, with its direct rays, scarcely ever enters.

The world over, country people are more hospitable than city people, and this is no less true in regard to the sunlight. But even our rural cottages are often encompassed by thick ranks of shrubbery, and high trees, armed with long, heavy branches, to protect the family mansion from one of the best friends God ever sent to his suffering creatures.

When the fair sex venture forth from their poorly ventilated and sun-excluded dwellings, how cautiously and jealously they shield themselves against the sun's rays, by the heavy shawl, the thick veil, the parasol, and the tightly fitting glove; and that too on the mildest and loveliest days of the year—as far as possible making themselves proof against those genial influences to which they are indebted, not only for health and life, but also for the delicate hues of beauty which they prize so highly.

We ride out to "take the air," in covered vehicles, from which the sunlight is excluded almost as effectually as from our darkened chamber at home. We draw our infants in little carriages, but shield them from the rays of the sun, which they never see at home, and which is almost as essential to their perfect health as pure air itself. And, worse than all, when this unnatural deprivation of the influence of the great source of health, and life, and beauty has induced disease that renders it impossible to go out beneath the open sky, one of the very first steps taken is to make the dark chamber of the invalid still darker by tightening the blinds and drawing lower the shades, as if it were desired to test, to the utmost, the recuperative forces of nature against all the appliances of art.

The beneficent influence of sunlight should be studiously considered in our treatment of the sick, especially those afflicted with the so-called nervous disorders. *Dyspeptics, rheumatics, paralytics, and sufferers from neuralgia* and other nervous diseases, do well to take frequent and protracted *sunlight baths.* The rooms of the invalid should be flooded with sunlight, and the entire surface of the body should be systematically and thoroughly exposed to it. If these principles were understood and acted upon by the profession and the laity, the ratio of nervous symptoms would largely decrease, and nature would experience far less difficulty in curing her afflicted children.

From Dr. Winslow's excellent work I quote as follows:

"Fourcault affirms that where life is prolonged, perhaps to the average term, the evil effects of the want of light are seen in the stunted forms and general deterioration of the human race. It appears that the inhabitants of the arrondissement of Chimay, in Belgium, three thousand in number, live partly as coal-miners and partly as field-laborers? The latter are robust, and readily supply their proper number of recruits to the army; while among the miners it is in most years impossible to find a man who is not ineligible from bodily deformity or arrest of physical development.

"In the spring a potato was left behind in a cellar where some tools had been kept during the winter, and which had only a small aperture at the upper part of one of its sides. The potato, which lay in the opposite corner, shot out a runner which first ran twenty feet along the ground, then crept up along the wall, and so through the opening by which light was admitted.

"This fact is observed in the *etiolation* or blanching, as it is termed, of certain kinds of vegetables, such as celery, sea kale, endive, &c. Their leaves, deprived of the sun's rays, do not attain their normal growth or form, neither is the natural odor of such plants fully developed.

"Professor Robinson, descending into a coal-mine, accidentally met with a plant growing luxuriantly. Its form and qualities were new to him; the sod on which it grew was removed, potted, and carefully attended to in his garden. The etiolated plant languished and died; but the roots speedily threw out vigorous shoots, which, from the form of the leaves and their peculiar odor, he readily recognized as tansy. He repeated similar experiments upon other plants, viz.: lovage, carvi, and mint, with analogous results."

Of the influence of moonlight, Dr. Winslow thus expresses himself:

"It is curious to trace the effects of sol-lunar influence upon the return and progress of maniacal paroxysms. They generally begin immediately after the summer solstice, are continued with more or less violence during the heat of summer, and commonly terminate towards the decline of autumn. This duration is limited within the space of three, four, or five months, according to deficiency of individual sensibility, and according as the season may happen to be earlier, later, or unsettled as to its temperature. Maniacs of all descriptions are subject to a kind of effervescence or tumultuous agitation upon the approach of stormy or very warm weather. They then walk with a firm but precipitate step; they declaim without order or connection; their anger is roused by trivial or imaginary causes; and they express their feelings by clamorous and intemperate vociferation.

"It is a well-established fact that insanity is a disease of the mind, upon which the moon exercises an unquestionable influence. The new moons and the last quarters of the moon are the lunar phases which influence the insane most frequently and painfully.

"The first quarters and the full moons are the phases which I have observed to have the least influence in inducing relapses of insanity—the insane at these periods being less insane and quieter, and they reasoned almost as if they were not ill at all. Those who are still susceptible of being cured, as well as those who have been cured, are precisely those upon whom the two most powerful lunar phases have had the greatest influence during the whole of their illness.

"Those who are acutely maniacal are much more susceptible to the influence of the lunar phases than others."

Daguin says: "I have also observed a difference between the influence exerted by this satellite on madness characterized by excessive joy, and that by sorrow and melancholy. It is proved that this influence is much more marked in parts of the countries bordering on the sea than in those at a distance from it."

We have not yet spoken of water as one of man's best physicians. Water is composed of oxygen and hydrogen, in the proportion of eight parts of the former to one of the latter. We have seen that atmospheric air is the result of a mixture of oxygen and nitrogen; water, on the contrary, is the result of a chemical combination of its two elements, oxygen and hydrogen, so that there is produced a substance entirely different from either.

Those who have not studied the subject may be surprised to learn how universal and abundant water is when compared with other substances. It covers three-fourths of the surface of the earth, and constitutes much more than half the weight of animal and vegetative life. There is water in the atmosphere, even in the driest season; water is carried by the gentlest zephyr as well as by every stormy wind that blows. There is water in the hardest of the woody fibres, in the most shrivelled barks on the trees, in the thinnest leaves and in the most delicate flowers. Water forms three-fourths of the human body. It is found in the hairs, in the tough cartilage, in the hard bony tissue, and even in the dense, pearly teeth. Water impregnates and saturates nearly every substance on the face of the earth, so that there is scarcely an article of furniture or adornment, of food or apparel, that would not weigh less when thoroughly, absolutely dried.

The uses of water are as varied as its presence is universal. It is nature's great chemist, and is invested with power to dissolve a large number of other substances, and yet it does not irritate the animal tissues of which it forms a part. On the other hand, the powerful solvents that man has sought out and contrived are more or less painful if not destructive to animal life.

Water is also the great cooler of the world. It possesses a greater capacity for taking up heat than any other substance. For this reason it is always cooler in the neighborhood of the sea-shore, or on the borders of lakes, pools, swamps, and rivers. When water is evaporating its capacity for heat is much greater than when it is in a liquid state. Hence the evaporation from the lungs and skin is a cooling process ; for this reason those whose lungs are so feeble that they cannot take full breaths, or who do not perspire freely, always suffer intensely in hot weather, or after severe physical exertion.

The delights of the sense of taste are largely dependent on the solvent power of water, and, as a rule, all the most luscious and highly prized meats, and fruits, and plants are chiefly composed of liquids. Water is also a powerful absorbent of gases, both the good and the bad. Within a few hundred feet of the surface of the sea, where most of the fish are found, there is always present a sufficient amount of oxygen to meet their wants.

Water is rarely or never found in a state of absolute purity. The water of the ocean is one-thirtieth part solid matter, including the salts of potassium, sodium, calcium, and magnesia. The waters of rivers, lakes, and springs all contain more or less solid material that they take up from the soil through which they pass. Rain-water, the purest of all, usually contains more or less traces of nitric acid and ammonia that it has derived from the air in its passage through it. Pure water, which can be only obtained by distillation, is quite insipid, because it contains no solid matter that we are accustomed to taste in our ordinary drinking water.

In view of the universality of water and the variety of uses to which it is applied, its hygienic and therapeutic importance is at once suggested. Water should be drunk freely during our meals, or after them, or in the intervals, just as the natural thirst demands. There are those who have advised to abstain from drinking entirely until we have eaten the solid articles of our meals. The advocates of this theory base their argument chiefly on the fact that our domestic animals never drink while they are eating. There is no absurdity to which we may not be led if we take the lower animals as our guides in the study of hygiene. Any enlightened man will find his own natural appetite, under the guidance of reason and experience, a far safer adviser than the entire animal creation. Iced water at meals is a most unnatural drink, especially when not combined with hot tea, coffee, or spirits. It lowers the temperature of the stomach, and thus impedes digestion, while tepid or warm drinks, by their solvent and gently stimulating power, have a directly reverse effect. Cool waters from deep wells are always to be preferred to iced drinks, not only during meals but at all other times, even when the stomach is absolutely empty.

SLEEP.

From *fifteen to twenty hours* is as long as the average of men can keep in activity without an interval of absolute rest. After we have become wearied of study and thought, wearied of muscular exercise, wearied of social life, and of every form of recreation, there comes in every twenty-four hours a time when we feel the need of more perfect rest than can possibly be obtained by any variation or change of activity. Nature meets this great need by allowing us to sleep.

Sleep is food for the brain. It is not positive nutriment like our ordinary food, but in a necessary or negative sense it is really nutritious, for it retards the changes of tissue in the brain, and thus in a measure takes the place of food. It slows the fires of the system, and therefore diminishes the consumption of fuel. In sleep, the system, to borrow a nautical phrase, "goes under one bell."

Sleep is the most absolute form of rest that the system is capable of, and yet it is far from being perfect. The brain, the muscles, and the vital organs are never perfectly at rest, even in the soundest sleep. Even though the interval between retiring and rising is passed in blissful unconsciousness, yet changes of tissue are incessantly going on in every organ and in every fibre. In the soundest sleep of which we are capable, still beats the heart with its mighty and rhythmical pulsations; still courses the blood through all its myriad channels to every organ and molecule; still rise and fall the lungs, harmonious with the throbbing of the heart; still go in the complex processes of digestion and assimilation, of absorption and secretion, of waste and repair; still are maintained, with constant though diminished activity, those unnumbered processes of vital chemistry, which eye hath not seen nor ear heard, neither hath it entered into the heart of man to conceive; and what is more wonderful and marvellous than all—still are elaborated in the brain, with constant though irregular activity, the functions of memory and imagination, of emotion, fear, apprehension, sorrow, and joy—of every faculty of the human intellect, except the gift of reason and the might of will.

The intellect is never perfectly at rest. In the soundest sleep the brain is ever busy with those unguided and erratic fancies and activities which we dignify by the name of dreams.

In sleep the volume of blood in the brain is diminished.—This fact has been pretty well established by recent experiments. It has also been proved by experience, that remedies which have a tendency to reduce the volume of blood in the brain assist us to sleep, and are therefore useful for those who are troubled with wakefulness.

Though sleep is not perfect rest, it is yet the best that is allowed to mortals, and when taken in sufficient quantities is sufficient for the wants of the system. Its laws are therefore worthy of careful study.

Our mechanics and laborers, as a rule, have less than students and literary, professional, and business men. The majority of our artisans and day-laborers are obliged to commence work by seven o'clock in the morning, and therefore find it necessary to rise by five or six. Many others are obliged to walk or ride several miles to their places of labor, and must therefore have breakfast long before the brain-working classes are out of bed. Farmers are compelled to rise early in the busy season of the year, and oftentimes they are accustomed to work hard and long before breakfast. It is true that the classes here mentioned oftentimes go to bed somewhat earlier than students, or literary and professional men, but their habits in this respect are by no means uniform. Thousands of our artisans and mechanics spend their evenings in amusement or dissipation until nearly midnight, or even later, and after five or six hours of sleep start again to their daily tasks.

On the other hand, about all classes of brain-workers—merchants, bankers, lawyers, clergymen, men of letters, teachers, and students—are, with some exceptions, accustomed to lie in bed until six, seven, and eight o'clock, although they retire, on the average, before eleven. Thus they get from seven to nine hours of sleep, or at least pass that time in bed; while their subordinates—their draymen, the coachman, the laborers, and artisans in their employ, and their family servants—must content themselves with but five to eight hours. On that average, then, our brain-workers have from one to two hours of sleep more than the muscle-workers. This is just as it should be.

Those who live by thought consume more tissue than those who live by muscular activity, and, in spite of all erroneous teachings, they find by experience that they must have a correspondingly greater amount of sleep.

Laborious workers need all the sleep that they can get, whether at night or in the daytime.—The night is the most appropriate season for sleep, and yet we should never hesitate to take a nap in the daytime whenever we find it necessary. Amid the cares and responsibilities of our modern civilization, there are unnumbered interruptions and contingencies that make it practically impossible for us to obtain our full amount of sleep in the hours that are usually devoted to that purpose.

To sleep is the one great hygienic commandment. It is the Alpha and the Omega, the beginning and the end, the first and last of the great laws of mental hygiene. He who understands and obeys this law really understands and obeys the whole hygienic decalogue, for no one can long sleep well who persistently disregards the other laws of health. Sleep is one of the best of our thermometers of health. By the quantity and quality of sleep that our patients can take we can best judge of their daily condition and of their progress toward recovery. We always feel assured that whatever improves the sleep of the exhausted invalid, to that degree helps him toward recovery, and that whatever disturbs this sleep, to that degree brings on relapse and disease. Prolonged sleeplessness is one of the earliest and most constant symptoms of insanity, of hypochondria, and of all the nameless forms of nervous disarrangement. Whenever, therefore, we find that we are not sleeping as well as we are wont; when our dreams are peculiarly dark, and ugly, and distressing, and leave unsightly scars in the memory; when we roll, and toss, and worry through the watches of the night, anxiously waiting for the day; when we awake long before our accustomed hour of rising, and find no pleasure in the morning nap, then may we suspect that our bark is nearing the quicksands and shallows, and then without delay should we examine our charts, revise our calculations, and according to our best judgment, return to the channel from which we have suffered ourselves to be driven.

Sleep of Plants.—A certain author thus compares the rest of plants to the sleep of the animal creation:—

"In many plants we even find something which may with great propriety be compared to the daily sleep of man. Their leaves every evening are contracted, or droop, their flowers shut themselves up, and their whole external appearance displays a state of rest and repose. Some have ascribed this to the coolness and moisture of the evening; but the same thing takes place also in the greenhouse. Others have considered it as a consequence of darkness; but many shut themselves up in summer at six o clock in the afternoon. Nay, the *Tragopogon luteum* shuts itself up so early as nine in the morning, and this plant therefore gives us reason to compare it to certain night birds and beasts of the animal world, which are active only during night, and sleep in the daytime.

"Every hour of the day even has some plant which then shuts itself up, and on this is founded what is called a *plant-dial*."

CLOTHING.

A necessary rule to be attended to, for preserving the body in a proper state of health, is to protect it from such effects as have a tendency to obstruct the perspiratory matter. In the sultry days of summer, every precaution should be taken that the body be not suddenly exposed to cold when overheated by exercise, by throwing off a portion of our clothing, as some persons are apt to do. Another rule to be attended to is to adapt our clothing to the climate, the different seasons of the year, and the period of life.

In warm climates, what is worn next to the skin should be made of cotton in preference to linen, which, when moistened with perspiration, is very apt to convey a sense of chilliness when the body becomes cool again. A proper attention ought to be paid, at the same time, to the situation of the person's residence; to the frequency and violence of storms, and to the different periods of the day; avoiding, if possible, an exposure to the moist and damp air of the nights; but, where this is unavoidable, clothing the body accordingly.

Our summer clothes ought not to be worn too long, nor our winter ones put on too soon. In making the change, it will be best to do it *gradually*, which precaution is more particularly necessary for those who have passed the meridian of life.

Another material rule to be attended to, with respect to clothing, is to adapt it *not only to the seasons, but to the vicissitudes of the weather at different periods of the same day.* An attention to this point is particularly necessary where the weather is variable, and the transitions from heat to cold very sudden at different times of the same day.

In early life it is not so necessary to cover the body with a quantity of clothes, because the blood circulates with due energy, and the perspiration is free; but in advanced life, when the circulation is more languid and the skin more rigid, the clothing ought to be increased. A defect of due perspiration is probably the cause of many of the diseases to which the latter period of life is subject; but this may, in some measure, be prevented by wearing, next to the body, those articles of clothing which are best calculated for promoting a due discharge from the skin by perspiration, such as those made of cotton, flannel, or fleecy hosiery.

The precise quantity of apparel which may be necessary for any person cannot be prescribed. It must be entirely a matter of experience, and every person is the best judge what quantity of clothes is necessary to keep him sufficiently warm and comfortable.

Every person should be careful that his linen is properly dried previous to its being put on. Many lives are annually sacrificed by persons putting on damp linen, as well as by sleeping in sheets not properly dried.

Due care should be taken to change the stockings, and other clothing, as speedily as possible after their becoming wet by an exposure to inclement weather. Many persons are so imprudent as to neglect this very necessary change, and to suffer their clothes, after such an exposure, to dry on them, assisted probably by going near a fire for some time; but such a practice is always attended with risk, and not unfrequently gives rise either to rheumatism, fever, pleurisy, cough, consumption, or some other disease of a dangerous, or even fatal nature.

In warm climates, most persons are in the habit of changing their dress twice a day, particularly their body linen. Indeed, where such articles of dress are once soiled by copious perspiration their speedy renewal and change is not only necessary for the sake of comfort, but also for the preservation of health.

No part of our dress should occasion pressure. Cravats, stocks, necklaces, &c., should not be tight about the neck, as in this way they obstruct the blood in its course from the brain, and thereby give rise to headache, giddiness, fainting fits, or apoplexy. Neither should our garters be worn too tight, as they thereby not only prevent the free motion and use of the parts about which they are bound, but likewise obstruct their equal growth and nourishment, and give rise to varicose distention of the veins, aneurism of the crural artery, &c. But the most destructive way of applying tightness is that of squeezing the *stomach and bowels into as narrow a compass as possible, by the close lacing of stays, for the purpose of moulding the figure into what is called a fine shape.* Many women are sacrificed by this injurious practice. *Tight lacing* is attended with very injurious consequences, as the action of the stomach and intestines, the motion of the heart and lungs, and all the vital functions are impeded; hence arise fainting fits, indigestion, costiveness, obstructed menstruation, coughs, consumptions, and many other complaints.

Attention should be given to the different materials from which our clothes are made.

Wool is an excellent material for clothing. Clothing keeps us warm, by *retaining* the heat that is in the body. They impart no heat. Clothing, in order to be warm, should be a *bad conductor* of heat. Wool is such a bad conductor. It is therefore very warm. Flannel is the best substance to be worn next to the body.

Linen is a *good* conductor of heat. It is therefore not warm, but is adapted for hot weather.

Cotton is not so good a conductor of heat as linen, and is therefore warmer.

Clothing should be more or less *porous*, so that the perspiration may have free passage.

The *color* of the clothing is a matter of importance.

White clothing does not absorb the rays of light well, and is therefore cool. *Dark* clothing absorbs the rays, and is therefore warm.

These facts have been established by direct experiment.

BATHING.

Personal cleanliness is chiefly effected by a frequent change of dress, but is much increased by ablutions of different parts of the body daily with water. The teeth ought to be cleansed after every meal, as the refuse of the food settles about them, rapidly becomes putrid, and proves injurious to them, as well as to the gums. Every morning the tongue should be cleansed, and the throat be well gargled and washed out with water.

The teeth are apt to become incrusted with tartar, which in time very much injures the enamel with which they are coated externally; it should not, therefore, be suffered to collect, but be removed from time to time. They should be washed every morning with a small piece of sponge, or very soft brush, dipped in cold water, joining occasionally the powder of charcoal. If any of the teeth have a tendency to caries or rottenness, or the gums are spongy and bleed, the mouth may be washed with equal parts of the tincture of myrrh and bark, somewhat diluted with water.

Attention to the feet is also very necessary, particularly in warm weather, and with those who, from a peculiarity of constitution, have them very moist. The perspiration proceeding from them in hot weather, and after much walking, emits a very disagreeable smell. They ought, therefore, to be frequently washed; but no means for stopping the discharge should be resorted to, as serious diseases might thus be induced. Great cleanliness, by daily ablutions of the feet and a change of stockings, are not only the most convenient, but the most salutary means of preventing all discomforts.

Ablutions with water should also be extended to other parts of the body. When a habit of cleanliness is once established, no rules will be requisite, as the feelings of the individual will sufficiently indicate what is proper in this respect.

Frequent ablutions or immersions in water are very beneficial, and are the most effectual preventives of many distressing maladies. Cleansing the skin by rubbing, washing, and bathing is a very salutary operation. Indeed, it is nearly impossible for any person to be perfectly healthy who lives in the constant and habitual neglect of these means.

Where the person labors under no disease which is contradictory to the employment of a cold bath, this may be substituted in the summer and autumnal periods of the year for minor ablutions of the body; and bathing in the sea is entitled to a preference among the young and middle-aged. Cold bathing does not, however, produce any considerable tonic effect upon old persons; and besides, any sudden chilling of the skin repels the circulation from the surface of the body, and determines the blood upon the inward parts, which is always attended with some risk to persons advanced in life.

To ascertain whether or not cold bathing is likely to be serviceable to the person who employs it, he has only to attend to the following circumstance. If, after bathing, he feels a genial glow of warmth pervade the body, with an increased degree of vigor, he may be assured that it is likely to prove beneficial; but, on the contrary, if he feels a cold or chilly sensation remaining some time after, it should not be persisted in.

The best time of the day for cold bathing is before breakfast, but it may be used at any period of the forenoon, taking due care not to resort to it when the body is heated by exercise, nor immediately after a meal on a full stomach.

Inuring children to cold bathing is generally productive of much advantage to them, particularly those who are perceived to be of a weak constitution, provided they labor under no organic disease In conjunction with proper exercise, it is of all means the best calculated to make them strong and healthy, and may be considered as a powerful antidote against the rickets, scrofula, and many other disorders.

For elderly people tepid bathing will be more appropriate than the use of a cold bath, and will be found no less salutary than pleasant. A warm bath is a remedy of high utility where any check has been suddenly given to the perspiration by an exposure to cold or wet, and it proves very serviceable in many disorders, such as inflammatory affections of the stomach and bowels, rheumatism, and various other diseases.

PAN FOR SPONGE OR HAND-BATH.

ARRANGEMENT FOR SHOWER-BATH.

The *topical* as likewise the *general* use of hot water in the form of vapor is likewise a remedy of great utility in various complaints. Whenever the joints become rigid, and the pain upon motion exquisitely severe, or where the muscles are contracted (and, indeed, in all protracted cases of any disease of the hip-joint, lumbago, or sciatica), the vapor of hot water, properly applied, will seldom fail, in conjunction with other suitable applications, to prove a safe and successful remedy. The mode of applying it *topically* must be regulated according to circumstances. A large boiler, with a long pipe or tube affixed to it, forms a simple apparatus. By means of this the parts affected may be steamed for about half an hour at a time, repeating the process twice or thrice a day.

TURKISH AND RUSSIAN BATHS.

These methods of bathing are now rapidly growing into popularity. In New York City there are several establishments where the baths are provided for those who have the time, the means, and the opportunity to enjoy them.

The only difference between the Turkish and the Russian bath is, that in the former the patient is first subjected to *hot air*, and in the latter to *hot vapor*. The subsequent processes of *shampooing*, *kneading*, and *rubbing*, and *showering*, and *plunging* are the same in both. The common impression that it is injurious to take a shower-bath of cold water, after a hot-air or vapor-bath, is erroneous. The truth is, that the system is better fitted to take a cold shower or a plunge into cold water after the system has been thoroughly warmed, *provided we are not exhausted*. Those who bathe in a cold stream, after they are wearied by severe labor or a long walk, are very apt to injure themselves.

In the Turkish and Russian baths the bather reclines, as represented in the accompanying cut, for some little time, until, by the influence of the hot air or vapor, he is thrown into a profuse perspiration. He is then rubbed by an attendant, and afterward receives a shower or douche of cold water.

THE TURKISH AND HOT-AIR, AND RUSSIAN OR VAPOR BATHS.

The duration of the bath is from *ten* minutes to *two* hours, according to the constitution and habits of the bather.

Besides their general cleansing and invigorating effects, these baths are oftentimes of decided service in rheumatism, neuralgia, and various nervous conditions.

They ought always to be in the hands of careful, and skilful, and honorable men. In every bath-room there should be a superintendent, to take especial charge of all invalids and newcomers. For want of this guidance and direction, the weak oftentimes have the same treatment as the strong, and are thereby injured. Every establishment should have two or three rooms, with the temperature graduated to the strength of the bathers.

REGULATION OF BOWELS.

Too great a looseness of the bowels or habitual diarrhœa, is productive of as much danger and inconvenience, as considerable constipation. The occasional occurrence of a moderate looseness is frequently only an effort of nature to expel and carry off something morbid from the intestines, and therefore not to be considered in the light of a disease; still, when it occurs too frequently, or too copiously, and is long continued, some obscure disorder in the bowels, or some material defect, may be suspected. Under circumstances of this nature, the looseness must be stopped, or rather mitigated by the assistance of medicine; otherwise the body will be deprived of its due nourishment, the strength and spirits be exhausted, and ultimately it will destroy life.

One *copious* stool a day is sufficient for an adult in health. More or less may be injurious in a general way. To obtain this regular action of the bowels, the best plan is to rise betimes in the morning, take gentle exercise in the open air, then breakfast, and very soon afterwards visit the privy, whether the person has an inclination or not, *soliciting* nature patiently and perseveringly and by proper efforts. Habits of this kind may be acquired, which will in time become perfectly natural. In this way many cases of habitual costiveness have been completely subdued, and perfect regularity in the action of the bowels established.

A serious evil attendant on frequent recourse to medicines for the purpose of removing costiveness is, that after a time, the bowels will not act without them, from a want of the accustomed stimulus. Those who are subject to habitual constipation, had better attempt to remove it by diet and exercise, than by drugs, carefully avoiding, at the same time, all articles of aliment which are of an astringent nature.

Persons troubled with habitual looseness, should make use of food that is likely to brace and strengthen the bowels, and which is rather of an astringent quality, such as rice boiled, milk, eggs, cheese, sago, arrow-root powder, and wheaten bread made of the finest flour. Red Port wine, brandy sufficiently diluted, and toast and water, will be the most appropriate liquors to drink.

As obstructed perspiration is not unfrequently a cause of looseness in the bowels; persons who are affected with it, should wear flannel next to the body, and carefully avoid all exposures to cold.—(See *Constipation.*)

THE URINE,

When it is too copiously discharged, it gives rise to thirst, emaciation of the flesh, prostration of strength, depression of spirits, &c., and constitutes that species of disease called diabetes. On the contrary, when the urine is too long retained, it is not only re-absorbed or taken up again into the mass of fluids, but by stagnating in the bladder, it becomes thicker, and the formation of gravel and stone is promoted. Hence it happens, that indolent and sedentary persons are much more liable to these diseases than those who lead an active life.

It has been supposed that the quantity of urine secreted, and voided in the course of the twenty-four hours by a person in health, is generally about a third part of the fluids that are taken. This being habitually exceeded is presumptive proof of debility, with too great a laxity of the urinary organs and passages, the effect of which is to expose the person to a general waste of the flesh and strength The urine being smaller in quantity than what has been stated as the general average, unless proceeding from a deprivation of liquids, denotes an extraordinary degree of heat in the system, or it may arise from a dropsical tendency, or from some obstruction in the urinary passages.

By retaining the urine too long, many persons have greatly endangered their lives. The calls of nature in this way, ought, therefore, never to be postponed; for if the bladder is over distended, it is very apt to lose its power of action altogether, and to become unable to expel the urine properly, and this over-distension destroys the powers of the organ.

A retention or suppression of urine, under all circumstances, and in all situations, may be considered as an alarming and dangerous disease, which demands the most prompt and speedy means of relief that can be afforded. In pregnant women, in or about the time of labor, the urine being retained or suppressed, calls for prompt assistance, otherwise they will be exposed to the risk of a ruptured bladder, or a retroversion of the womb.

PERSPIRATION.

Perspiration is the fluid that is secreted by the extremities of the cutaneous arteries from the external surface of the body. It is usually distinguished into *sensible* and *insensible*. The last is separated in the form of an invisible vapor; the first is visible in the form of very little drops adhering to the skin.

The insensible perspiration is supposed to exceed any of the other discharges from the human body, and is of the utmost importance to health; for when it is obstructed, the whole frame soon becomes disordered. It varies in quantity according to the temperature of the atmosphere, the season of the year, climate, age, sex, and general mode of living. Thus men have a more copious, viscid, and higher colored sweat, on summer days, and in warm countries, than in colder regions. The sweat of a man usually exceeds that of a woman, and is also supposed to be of a more acrid smell. The young are more subject to sweat than the aged, who, during the excessive heat of summer, perspire very little. A long abstinence from drink causes a more acrid and colored sweat; and the drinking a great quantity of cold fluids in warm weather, a limpid and thin perspiration.

The uses of the insensible perspiration are, to liberate the blood from superfluous animal gas, azote, and water; to discharge the noxious and heterogenous excrements; hence the acid, rancid, or putrid perspiration of some men.

The use of what is termed the sensible perspiration, or sweat, in a healthy man, is scarcely observable, unless from an error of the six non-naturals, which comprehend air, meat and drink, sleep and watching, motion and rest, retention and excretion, and the affections of the mind. The first effect of the sensible perspiration on the body, is somewhat prejudicial, by its exhausting and drying it, although it is sometimes of advantage by supplying a watery excretion; (for when the urine is deficient in quantity, the sweat is frequently more abundant;) and also by discharging at the same time, any morbid matter; thus various subtile particles are critically expelled from the human body, in acute and chronic diseases, with the sweat.

Whatever gives a sudden check to perspiration may be productive of very injurious consequences, and these should be carefully guarded against, as many persons annually die by not paying proper attention to the various causes from which perspiration may become obstructed; one of the most common of which is, taking cold.

By sudden transitions from heat to cold, either from changeableness of the weather, the state of the atmosphere, going immediately from a hot room into the cold air, or throwing off some part of the clothing when heated by exercise, the perspiration is very apt to be obstructed, and colds, coughs, and inflammation of the lungs are the usual effects of such conduct. Drinking freely of cold water, or any other small liquor, *when the body is heated*, is not only injudicious, but fraught with many ill consequences. Damp houses, and damp beds, or linen; exposure to night air, especially in hot countries; not changing clothes quickly after their getting wet; and continuing to wear stockings, shoes, or boots which are saturated with water, exposing the feet thereby to cold, are all likely to be attended with injurious consequences, by occasioning obstructed perspiration. The same will happen by throwing open a window, when the room is hot, and sitting in or near it, so as to be exposed to a current of air. In the hot season of the year, some persons sleep with a window open. Whenever this practice is adopted, great care should be taken that the window is at a considerable distance from the bed, and that the air admitted into the chamber does not come in a current upon the person. *Some, however, can sleep in a current of air without injury. When the windows are open there should be plenty of clothes on the bed.* It is always injurious to sleep cold.

Some are so imprudent or foolhardy as to bathe themselves in cold water when considerably heated by exercise, and by such conduct have been soon attacked with severe disease. In some instances death has been the consequence.

Some persons, when they happen to get wet feet, wash them with some kind of ardent spirit. This is always attended with very great danger; for instead of promoting and keeping up the due circulation in the feet, it will greatly increase the check which has been given to it by the exposure to wet. The speedy evaporation of the spirit produces a considerable degree of coldness. The better and safer way is, to well dry the feet, then to rub them for some time with flannels made warm by the fire, covering them afterward with woollen stockings; and lastly, for the person to take a little warm drink, keeping for some time in motion.

On all occasions, carefully avoid sudden transitions from heat to cold, keep the body in as uniform a temperature as possible, and when it is overheated let it cool gradually.

INFLUENCE OF THE WEATHER ON THE CHARACTER

The three great influences that determine the character of individuals and nations are *race, climate, and diet.*

To a certain extent, individuals as well as communities are elevated or depressed by the government under which they live, by their religious belief, by their education, and by their material and social surroundings; but, then, all these ultimately depend on the character that has been inherited from generation to generation, and that has been developed and modified by climate and diet. Comparing the influence of hereditary descent and climate, we know by the testimony of history that the first has always been dominant. The Indo-European race, for example, has always triumphed wherever it has extended. It has embraced a large number of widely-diverging nationalities under opposite phases of climate, but it has always conquered. The Indo-Europeans of warm climates have not been equal to those of temperate or colder regions, but they have shown *relative* superiority as compared with the nations about them who were subject to the same climatic conditions.

The same general facts have been observed in the history of races everywhere. All people can, in a measure, rise superior to the depressing influences of excessive heat; but all, whatever may be their descent, however great their native energy and ability, are inferior to the same people in the temperate zones.

It has been the custom to speak of the religious belief, the form of government, the system of education, as the great causes of the differences in nations. As I have said, these influences have, undoubtedly, a share in the work of moulding humanity; but inasmuch as they are themselves determined very largely by hereditary descent and by climate, they cannot be regarded as final causes.

The effect of climate is seen in the history of the Jews more markedly, perhaps, than in that of any other people. The Jews, in all parts of the world, are descended from a common stock. Almost invariably they intermarry, and in every way strive to maintain and perpetuate themselves as a distinct and peculiar people. Their success has been almost complete. Their blood has but rarely mingled with that of any of the races with which they have associated. Therefore, whatever differences are seen in Jews in the various parts of the world may fairly be attributed to climate. In Palestine—their native country—they are of a tawny color; further east they are of a darker hue, in proportion as we approach the regions of torrid heat. In Europe and in North America their color is comparatively fair, and not unfrequently is as white as that of the Anglo-Saxon. They retain, however, wherever they have penetrated, or under whatever systems they have lived or suffered, the leading distinctive characteristics of their race. The shape of the nose, the color and expression of the eye, and the general physiognomy of the Jew, are as unmistakably diagnostic in Malabar as in Europe, in all the extremes of climate as in their own native Judæa.

The effect is also seen in the branch to which we belong. Concerning this important subject of races, there is much that is conjectural and misunderstood, but certain facts have been gleaned from the experience and research of the world that seem to be pretty well established. It is quite clear that Indo-Europeans—including the inhabitants of Europe easterly to Hindostan—are descended, in the main, from a common stock. But how very positive are the differences of color and appearance between the inhabitants of India and Central or Northern Europe! So far back as history sheds light on this subject, we find that the Gauls and the Britons were described as blue-eyed and of fair complexion. The color of the Hindoos is brown, and so far as is known or can be ascertained, has always been so.

All denizens of high latitudes are essentially inferior in intellectual as much as in physical stature. Their temperaments are not only coarse, but are exceedingly inactive, for their climate does not seem to allow them to exercise and develop what little of character may inhere in their race. Their nervous fluid seems to be literally congealed, and they evince less force of will, less character, less activity than the dweller by the Amazon, or even the negroes on the Congo.

It is very pertinent to inquire whether climate may not modify the quality and the quantity of the cranial contents. The question is, however, so deeply complicated by the differences, varieties, and intermixtures of races, that it is not entirely easy to answer. Reasoning from analogy, it seems very clear that when the brain is not used it must become more or less modified in form and structure, and undergo degeneration both of quality and quantity. We know that the muscles increase in size and hardness by exercise, and become flabby and small by long disuse, and it would seem that the brain and nervous system must follow the same law. Accordingly we find that the skull, which always adapts itself to its contents, slowly changes in form under long-continued and unfavorable conditions. Even in civilized lands we can trace a difference in the form of the skull of the higher and the degraded classes. Thickness of the lip, widely opened mouth, large and projecting jaws, low and especially retreating foreheads—these are the symptoms of ignorance, hard poverty and low life, just as the opposite appearances—thin, delicately chiselled lips, firmly closed, narrow gums, and broad, expansive brows—are the marks of intellectuality, character, and social position. Dr. Prichard calls attention to the fact that the Turks of Europe have lost the pyramidal shape of cranium that characterized their ancestors in Asia, and have gradually taken on the elliptical form. This change is the result of change in climate and mode of life.

Dr. Draper presents the following suggestive theory concerning the effect of climate on color:

"Now there is no organ which is more quickly disturbed in its duty by a high temperature than the liver. Whether such a high temperature produces its effect through a disturbance of the action of the lungs, or through an impression on the skin, is quite immaterial. If the organ be in any manner enfeebled in its duty, and no other avenue is open through which the degenerating hæmatin may escape, it must accumulate in the circulation, and be deposited here and there in suitable places. Under such circumstances, there arises a tendency for its accumulation in a temporary manner in the lower and more spherical cells of the cuticle, from which it is removed by their gradual exuviation and destruction as they become superficial. The temporary deposit of the coloring matter in this situation imparts to the skin a shade more or less deep. It may amount to a perfect blackness; for the origin of the black pigment of the negro is the same as that of the black pigment of the eye in all races, and the predominating percentage of iron it presents plainly betrays that it arises from a degenerating hæmatin, in which the same metal abounds."

"I believe, therefore, that the coloration of the skin, whatever the particular tint may be, tawny, yellow, olive red, or black, is connected with the manner in which the liver is discharging its function. That deposits of black pigment can normally arise in the way of a true secretion by cell action is satisfactorily proved by their occurrence in angular and ramified patches in the skin of such animals as the frog; and that hæmatin, in its degeneration, may give rise to many different tints, is substantiated by the colors exhibited by ecchymoses." The great difficulty in our study of the effect of climate consists in our want of positive and reliable knowledge of the early history of mankind. If we could trace the history even of any one race or tribe for a sufficiently long period, the question might be settled.

CHANGE OF RESIDENCE.

RULES FOR PERSONS WHO GO FROM A COLD TO A TROPICAL CLIMATE.

Avoid arriving in a tropical climate during what is termed the rainy season of the year; this, with some little variation, according to the place of destination, commences in August, and terminates at the end of October, or beginning of November.

Your place of abode should be somewhat elevated, dry, open to the air and sun. Marshy grounds, and stagnant waters, when acted upon by a powerful sun, always send forth noxious exhalations and vapors, which give rise to intermittent and remittent fevers, fluxes, &c. When obliged to inhabit a house which is situated low, it will be prudent to occupy one of its highest apartments.

Expose yourself at first, as little as possible, to the intense heat of the sun at mid-day, and cautiously avoid the dews and damp air of the night.

Wear cotton* next to the skin, not linen. Go early to bed, rise betimes, making use very soon afterward of a cold bath, one of the best means of counteracting the injurious influence of a warm climate, and affording the most grateful sensations.

After cold bathing, take gentle exercise, the morning being preferable for this to any other part of the day. Avoid any exposure of the body afterward to a current of air, and the drinking any cold liquor when you are much heated. If at any time overtaken by rain, so as to have your clothes wetted, change them as quickly as possible. Pay strict attention to cleanliness, not only by changing the linen once or twice every day, but also by minor ablutions of different parts of the body with cold water.

Persons just arrived in a tropical climate should partake only moderately of the delicacies of the table, and make a very temperate use of vinous or spirituous liquors. Before dinner, a solution of preserved tamarinds in water, simple lemonade, or the liquor known by the name of imperial, are appropriate drinks.

Such persons should also refrain from all amusement and exercises of a heating nature. They should moderate all sensual gratifications, and cautiously guard against a costive state of the bowels, by regularly repairing to the privy once or twice a day at a stated hour, and then *soliciting* natural evacuations. If at any time these efforts should not be attended with due effect, one or two motions ought to be procured by the aid of an injection, or some cooling laxative.

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* Flannel is, on some accounts, preferable to cotton.

Soldiers and sailors are very apt to suffer, in a tropical climate, from the effects of intemperance, conjoined with an exposure to intense heat during the day, and moist air at night; and it therefore greatly behooves those who are placed in command over them, to be as attentive as possible in preventing such occurrences. The health of seamen, in particular, will much depend upon their avoiding undue exposure to the sun, rain, night air, intemperance, unwholesome duties on shore, and, in fine, to all such occupations as subject them to excessive heat or noxious exhalations, as these never fail to be highly dangerous to those not assimilated to the climate.

When pitching tents for soldiers or sailors on shore duties, the driest and highest spots should be chosen, and under cover of these, hammocks should be suspended. The men ought not to be suffered to sleep on the ground.

Persons who come from a cold to a warm country are more liable to many diseases, and particularly to fever, than the natives, and those who have been acclimated by time. The same exposure will produce fever, or other disease, in a stranger, while the native and old inhabitant will not be at all affected by it; or even supposing that both are attacked, the symptoms will be tenfold more urgent and severe in the former than in the latter.

Observe a strict temperance in diet, living chiefly on vegetables and ripe fruits for the first two or three months, partaking very moderately of pure wine, and avoiding, as much as possible, any exposure to the intense rays of the sun during the day, and the cool or damp air of the night, until the constitution has become assimilated to the climate. In closing this article we give a word for those who come from a warm climate.

The principal precaution to be observed by those who leave a warm climate, and either visit or become settled inhabitants of a cold one, is to arrive in the latter before the approach of winter, and to make such a suitable change in every part of their dress as shall effectually guard their bodies against the difference and vicissitudes of the atmosphere which they must encounter. On this account waistcoats and drawers of flannel should be worn by persons of both sexes next to the body on the approach of cold weather, and the outer garments should consist of articles of a close and warm texture.

ATMOSPHERIC ELECTRICITY.

Electricity is usually present in the atmosphere. The amount varies with different seasons of the year and different hours of the day. Atmospheric electricity has a positive effect on the health, for good or evil. When the electricity is low—that is, when the amount of positive electricity in the air is small, as in the *middle of the afternoon, or twenty-four hours before one of our north-east storms*—then we are apt to feel stupid, sleepy, and depressed; then our corns, bunions, and sores begin to ache, then neuralgia and rheumatism and headache come on. *These are not matters of imagination; they are realities.*

The following table and remarks I quote from the report of Dr. Wislizenius, of St. Louis:

" *Yearly Mean of Positive Electricity, of Temperature, and of Relative Humidity of the Atmosphere at the hours of* 6, 9, 12, 3, 6, *and* 9, *from morning till night, based upon daily observation at those hours in* 1861, 1862, 1863, 1864, *and* 1865, *at St. Louis, Mo.*

ELECTRICITY.

YEAR.	6 A.M.	9 A.M.	12 M.	3 P.M.	6 P.M.	9 P.M.
1861................	8.5	9.9	9.0	7.7	8.5	6.8
1862	8.9	10.0	9.1	7.3	8.1	6.8
1863................	10.5	10.6	10.0	7.5	9.1	7.4
1864................	7.9	8.8	7.4	5.4	5.9	5.5
1865................	6.4	7.1	6.0	5.3	5.4	3.8
Mean................	8.4	9.3	8.3	6.6	7.4	6.1

REMARKS.

" The above table contains a summary of my observations of atmospheric electricity, for five years. They are based upon five daily observations, made with *Dellman's* instruments. As a result of these researches, I have found the following laws:

" 1. The positive electricity, floating generally in our atmosphere, exhibits a daily periodicity, by two maxima and two minima in twenty-four hours, a first maximum appearing about 9 A.M., a second about 6 P.M.; and a first minimum about 3 P.M., and a second about 9 P.M., which is continued till after midnight.

" 2. Besides this daily periodicity, there exists a monthly one.

The far greater quantity of positive electricity appears in the colder half of the year, and the lesser in the warmer half.

"3. There is possibly also a yearly periodicity of eleven years, following the same periodicity that exists between terrestrial and solar magnetism—between the declination of the magnetic needle and the solar spots. The present period extends from 1859 to 1870, with maxima at these two end points, and with a minimum in the middle, in 1865. The uncommonly low mean of electricity in 1865, which cannot be accounted for by other meteorological phenomena, seems to favor this supposition; but observations must be continued for many more years to decide that point."

This subject of the dependence of mental states on atmospheric electricity is one of exceeding interest. It is only recently that we have had observations concerning atmospheric electricity sufficiently detailed and reliable to be of service in studying this dependence of the character on the electrical state of the atmosphere. The writings of Dr. Wislizenius, above quoted, are of special value, because he is one of the very few who have given this subject attention.

In the morning, between 9 and 12 o'clock, we can usually work better than at any other portion of the day. This is the time of the day when there is the greatest amount of positive electricity in the air.

Between midnight and sunrise there is less positive electricity in the atmosphere than at any other time of the day. This is the time when, as we are told, more people die than at any other period of the twenty-four hours.

In the winter—in December and January especially—there is more positive electricity in the air than at any other season of the year. These are the months when we feel most like work. These are the months that students love.

In the summer, in July and August especially, there is less positive electricity in the air than at any other season of the year These are the months when we feel least like work.

Some attention has been given to the relation between atmospheric electricity and disease. The subject is yet in an unsettled condition, but some of the theories that have been advanced are at least suggestive. It is believed by some that our epidemics are caused by electrical changes. It is even claimed that the very familiar disease, intermittent fever, is caused by disturbances in the atmospheric electricity.

These theories have not commanded much attention, and are not generally accepted.

MANAGEMENT OF SICK ROOMS.

FURNITURE.

This should always be both selected and arranged so that every article whenever wanted, and however suddenly, may be instantly found, and without needless disturbance of the patient in any way. In cases of severe sickness (to which alone we here refer) the sick room should be disencumbered of all needless furniture; and all which can avail to the comfort and convenience of the invalid, should, if possible, be procured.

One small table should stand near the bed for all articles wanted for *frequent* use, such as glasses, cups, spoons, drinks, medicines for the day, &c.

A larger table placed more remotely from the bed, should also be provided for medicines and utensils *occasionally* used, and for an extra supply of pure water. This should be furnished, and from time to time replenished, and amply, with articles necessary to the various ministrations of the sick room, that the patient may not be disturbed by the opening and closing of the door whenever any such article may be suddenly needed.

There should always be in the room a convenient place of deposit for broad and narrow tape; old, clean linen; sponges; lint; rolls of muslin; linen and flannel bandages about two inches wide; pins, needles, thread, scissors, plasters, &c., that they may always be at hand upon any possible emergency.

Drawers should be furnished for a plentiful supply of clean, well-aired linen. Soiled linen should never be allowed to remain in the room a moment.

Again—provide a distinct place of deposit for an abundance of towels.

Let the wash-stand be constantly provided with additional vessels, and with an abundance of water.

A sofa, easily moveable, or something which will answer the same purpose, is very desirable—sometimes essential—for the comfort of the patient when the bed-linen needs to be changed.

The *entire* room should be carpeted for the sake of stillness, cleanliness and dryness. If but a part of the room can be thus covered, let the remainder never be washed, but swept, and (to avoid annoying the patient) with a brush, rather than with a broom.

A matress, a bed-pan, a pillow stuffed with curled horse-hair, or one made of India-rubber, to be filled with air, a thermometer, a pair of apothecaries' scales, a basin—when it can be procured—graduated to ascertain the quantity of blood taken by bleeding, a minim measure, to measure precisely the quantity of fluid medicine to be given at a dose, a syringe for the bowels, and a common *nurse lamp*, should always be at hand. With these articles every family should at all times be provided. Most of them can be obtained at small expense.

No kettle or any implement of cooking should be allowed in the room. The nurse lamp will answer for heating fluids.

BEDS AND BEDDING.

Beds without curtains are always preferable. In cases of fever especially, the matress should be placed uppermost. The bed-clothing should not be burdensome, and should be immediately removed and well aired, when the patient is transferred from the bed. The sheets used at night should be exchanged for others in the morning, and again used, if not soiled, at night. If this latter cannot be done, the sheets should be changed once in twenty-four hours, especially when the fever is infectious. This will essentially prevent its communication to the blankets or to the furniture of the room.

NOISE.

Even the slightest is excessively irritating and therefore injurious to the sick. To prevent it—open and shut the doors with the utmost gentleness, list them and oil their hinges—check the whistling of the wind through doors, windows, and key-holes—move all articles in the room with care—let every person in the room be shod with slippers or with something equivalent—forbid all needless conversation even in whispers, for *concealed* conversation will very probably excite the jealousy and fears of the patient—and *let no neighbors enter the room merely to gratify curiosity, to express sympathy or to give advice.* If their services are needed, employ them and thank them; otherwise exclude them. Medicines and medical skill have often been baffled, and the lives of the sick sacrificed by the intrusion, always agitating, of friends whose assistance is not needed.

VENTILATION.

Ventilation is always of primary importance, particularly in those fevers in which miliary eruptions display themselves; under no circumstances is it so essential as in febrile diseases of an *infectious* kind. Infection, however, rarely extends above a few feet from the body of the patient; and, even in the most malignant diseases, with the exception of confluent small-pox and malignant scarlet-fever of the worst kind, its influence does not exceed a few yards if the room be well ventilated. On the contrary, if ventilation be neglected, the power of infection becomes greatly augmented, it even settles upon the clothes of the attendants and on the furniture of the room; and these imbibe it most readily when their texture is wool, fur or cotton, or any loose or downy substance capable of receiving and readily retaining the air. Smooth and polished surfaces do not easily receive or retain infectious matter; consequently the nurses and attendants, in cases of infectious diseases, should have glazed gowns, and aprons of oiled silk.

In no infectious diseases are these rules more essentially necessary than in small-pox and scarlet-fever. It is well known that if the bed-clothes of a patient laboring under either scarlet-fever or small-pox be closely folded up, they will retain the infectious matter, and communicate the disease at a great distance of time; but the influence of free ventilation is so great, that medical practitioners who are attending small-pox patients, and who go from them into the open air, do not spread the disease. Indeed all infection is weakened by dilution with air. The danger of infection is augmented, if, along with bad ventilation, the atmosphere of the room be moist from any cause.

Infectious matter, even of the most virulent description, is not poisonous to every one within its influence. A predisposition of the body to receive the infection must exist before it can be communicated: a condition which is augmented by fatigue and watching, defective nourishment, mental depression, or anything which can lower the vital powers. The necessity, therefore, of maintaining these powers by attention to rest, a sufficient quantity of good and generous diet, and cheerfulness of mind, need not be insisted upon.

In every case of infectious disease, the attendants, even in the best ventilated rooms, should stand on the windward, or on that side of the sick-bed from which the current of air comes; as by neglect of this rule, and by standing in the current which has passed over the patient, the infectious exhalations are blown upon them in a direct stream from the body of the patient. The attendants should never lean over the sick, nor should they receive their breath. The health also of the nurses should always be supported by a nutritious and generous diet.

The term infection, in its most extensive signification, implies some deleterious matter, originating from any source and transmitted through the air, which is capable of causing diseases in the human body. When this matter is emanated from the diseased bodies of men, the term is frequently regarded as synonymous with *contagion;* but, in strictness of language, the latter refers only to the communication of disease by *contact.* To prevent the communication of disease by infection, not only is it necessary to dilute the atmosphere of the room with pure air, but also to destroy the virulence of the infecting matter by chemical agents or fumigations. (See *Disinfectants.*) But no such agent is equivalent to cleanliness, frequent changes of the sheets and linen of the patient, and free ventilation, for checking the propagation of infection.

TEMPERATURE.

Next to ventilation, nothing is of more importance than the regulation of the *temperature* of the sick-room, avoiding both extremes of elevation or of depression; but much depends on the nature of the disease.

The best general temperature of a sick-room is 60° (Fahr.), or that of summer in this climate; and it is preferable to regulate this rather by the thermometer than by the sensations of the patient or the attendants. Under some circumstances, however, the feelings of the patient, and his susceptibility of impressions upon the skin, should not be overlooked. Thus, if the temperature be a little above that of summer, and the patient, nevertheless, feel chilly, it should be raised five or six degrees. This chilliness is very apt to be felt in a dyspeptic state of the habit, and more especially when it is accompanied with hypochondriasis. It differs from that more severe but transient coldness which accompanies intermittent fevers and some other periodical affections; and it requires only an elevated temperature of the air for its removal, whilst the cold stage of intermittent diseases is best relieved by the warm bath, either general or local.

So important is the regulation of temperature, especially in fevers, that it often does more good than any other remedial measure. I have seen patients laboring under high delirium, in a close, ill ventilated room, become rapidly quite collected by merely lowering the heat of the apartment twelve or fifteen degrees. On the contrary, even a moderate depression of the usual temperature of the sick-room, in pulmonary diseases, will excite coughing and augment the severity of all the symptoms.

In regulating both the admission of air into the apartments, and temperature of the bed-rooms of the sick, in particular of those susceptible of pulmonary diseases, much caution is requisite not to overheat, nor to keep too dry, the air of the room.

CLEANLINESS.

Although cleanliness in the sick-room is essential, yet it may be carried so far as to become an annoyance to the invalid, and consequently to prove injurious It is not requisite to sweep the room daily, nor to dust and to arrange the furniture every morning, provided order be preserved in the room, and nothing but what is immediately necessary for the comfort and the convenience of the invalid be permitted to remain in it. It is truly distressing to observe the confusion which prevails in some sick-rooms: everything being out of place, and to be searched for when it is wanted.

The period chosen for cleaning and arranging the sick room should be the morning; as, after a night's rest, the patient is more able to bear the little noise and bustle which it always more or less occasions. The carpet should be sprinkled with moist tea-leaves and lightly swept; and, during this operation, the curtains of the bed, if there be any, should be drawn.

It is scarcely requisite to insist on the necessity of the utmost attention to the cleanliness of everything in the sick room. The moment after any vessel or implement is used by the invalid, it should be removed from the apartment, and returned as soon as it is cleaned. Nothing in the form of a slop-basin or a slop-pail is admissible: they only administer to the laziness of nurses.

The necessity of cleanliness in the vessels used for the food of invalids is strikingly illustrated in the bad effects arising from the neglect of it when an infant is brought up by hand. In such a case, if either the feeding-bottle or the boat which is employed be not instantly cleansed after the meal has been given, the small portion of the pap or food which remains in the vessel becomes sour, and taints the whole of the fresh food mixed with it, causing colic and convulsions in the infant. The same risk of injury occurs in the sick-room, if the vessels used for administering food to the invalid be not instantly and well cleansed, after every time they are used.

It is too customary, also, to use one glass or cup for administering medicines, and to leave it unrinsed from time to time—a custom which may prove as deleterious as a defect of cleanliness of vessels employed for food. Some medicines, when they are exposed to the air, rapidly undergo changes which alter their properties; and this alteration having been undergone by the small portion which is always left in the glass or cup, communicates the disposition to be decomposed to that which may be next poured into the cup. An active medicine may be thus rendered inert; or one which is mild in its operation may be so changed as to operate with hazardous energy.

The same precaution, as to cleanliness, is also requisite with respect to the minim measure, when the medicines are directed to be administered in a form which requires its employment.

FUMIGATIONS AND DISINFECTANTS.

It is necessary to preserve the sick-room free from all smells, and in as pure a state as possible. But this is difficult to be done when typhoid fever is present, or when any disease which is under treatment is accompanied with ulcers on the legs or on other parts of the body; and the difficulty is increased when the complaint is cancer, or when mortification occurs. In such cases, chloride of lime should be sprinkled over the floor of the room; and dishes containing it mixed with water placed in different parts of the apartment, and frequently replenished.

Whenever infectious or contagious fevers occur, fumigations are employed to prevent the spreading of the deleterious effluvia which emanate from the bodies of the invalids, and the extension of the diseases.

They are also necessary after these diseases; for the tenacity with which the infectious matter adheres to the substances in the sick-room is scarcely credible.

It is often, therefore, of as much importance to purify an apartment and its furniture after the termination of an infectious disease, as during its existence. In this case, the fumigation with chlorine about to be described should be used after the floor of the room and every solid thing in it have been washed with soap and water; and all bright metallic substances, such as pokers, tongs, and fenders, have been removed from it. The walls should afterwards be white-washed, or fresh painted or papered, and the room thrown open to the air for some time before it is again inhabited.

It may be said that *fumigations* are not to be solely relied upon; and that they ought never to supersede ventilation or cleanliness. Whilst this must be admitted, it would be absurd to deny their utility; consequently,. their nature and the mode of employing them should be understood.

Fumigations of the most varied kind have been suggested and employed for this purpose; namely, *Pastiles*, *Tobacco*, *Camphor*, *Vinegar*, *Ammonia*, the *Mineral Acids*, and *Chlorine*.

Pastiles, *Tobacco and Camphor*, are unworthy of the slightest confidence as agents for neutralizing infection. Merely to diffuse an agreeable smell throughout the sick apartment, pastiles and camphor may very properly be employed, but further than this, they ought not to be relied on.

Vinegar is, not without reason, regarded as possessing some chemical influence in decomposing infectious and contagious matters; and, consequently, it is almost invariably sprinkled over the floor of the rooms of those suffering under infectious diseases; or the vapor of hot vinegar is diffused through their apartments. It is thought to be still more salubrious, and a more powerful disinfectant, when it holds camphor or aromatic oils in solution; hence the great popularity of the preparations called *Aromatic Vinegar* and *Thieves' Vinegar.*

Vinegar, in this state of combination, is extremely agreeable and refreshing, both to the invalid and the attendants of the sick-room. The benefit which it produces depends upon a certain degree of stimulus imparted to the sensitive nerves, which are generally in a low condition in an infectious atmosphere: but, as a chemical agent, its powers are too feeble to be followed by much benefit.

The most efficacious *fumigation* which has yet been proposed is *chlorine.* This is extricated from the decomposition of muriatic acid by peroxide of manganese; but this is too expensive a process for ordinary occasions. The best materials, and the proportions of them, for extricating chlorine at a cheap rate was ascertained by Dr. Faraday, in the disinfection of the Millbank Penitentiary:—namely, *two ounces* of powdered peroxide of manganese, mixed with *ten ounces* of chloride of sodium (sea-salt), and *six ounces* of strong sulphuric acid, diluted with *four ounces* of water. This quantity of materials is sufficient for purifying a room forty feet by twenty. The mixture should be put into a porcelain cup or basin, which should be placed in a pipkin of hot sand. The doors and the windows of the room being shut, the fumigation may be left in it for ten or twelve hours; after which, both the doors and the windows should be thrown open, to admit a current of air to pass through the apartment and carry off the chlorine.

One objection exists to the employment of the above mode of extricating chlorine in apartments which are inhabited; namely, its powerful irritant influence on the lining or mucous membrane of the air tubes in the lungs, and the cough which it excites. In order to obviate these inconveniences, the *chloride of lime* is employed; which, by attracting the carbonic acid of the air, and causing the conversion of the lime into a carbonate of lime, separates the chlorine in a free or gaseous state. The chloride of lime should be mixed with water, in the proportion of one part to forty of the water, in a flat dish or plate, so as to expose a large surface to the action of the air; and the dish holding this mixture should be placed on a table, on the *leeward* side of the bed of the patient. The floor of the sick-room should be also sprinkled with it; and rags, moistened with it, suspended in different parts of the room. The solution of chloride of soda may be employed instead of the chloride of lime.

If the putrid odor in a sick-apartment do not arise from the general state of the system of the invalid, but from ill-conditioned ulcers and sores, these should be washed and poulticed with the solution of chloride of soda, which operates not only by destroying the fœtor, but by improving the condition of the sores.

Chlorine, even when extricated from chloride of lime, or from chloride of soda, is apt to excite coughing in those unaccustomed to breathe it. But the nurse should be made aware of this fact; and should so apportion the quantity of the materials on the first introduction of it into the room, that it may cause no such effect: and by afterwards adding to the number of the dishes in which it is distributed through the room, no inconvenience will result; the lungs being thus gradually accustomed to the irritant impression.

The decomposition and consequent development of the chlorine is much quickened by placing a piece of coarse calico in the bottom of the vessel containing the chloride of lime or the chloride of soda and water.

Dr. Ellis thus speaks of some of the best known disinfectants:

"M. Bonjeau directs charcoal, well powdered, two pounds; sulphate of iron, one pound; to be mixed, of which two or three tablespoonfuls are to be placed in the chamber vessels used by the sick.

"Dr. Procter has great confidence in iodine placed in open saucers about the room, or gently volatilized by moderate heat.

"Burnett's fluid consists of a saturated solution of chloride of zinc.

"Collins's disinfecting powder contains dry chlorinate lime, two parts; burnt alum, one part; used dry or moistened with water.

"Condy's fluid is a solution of the alkaline permanganates.

"Ellermann's deodorizing fluid consists of a solution of the perchloride of iron and the chloride of manganese.

"Ledoyen's disinfectant is a solution of two troy ounces of nitrate of lead in a pint of water.

"Siret's compound No. 2 contains sulphate of iron, 20 parts; sulphate of zinc, 10 parts; oak-bark, powdered, 4 parts; tar and oil, each one pint; made into balls. Used for deodorizing cesspools.

"Professor R. E. Rogers advises a mixture of quick-lime and sulphide of iron.

"The U. S. Army disinfectant consists of a powder of common salt and binoxide of manganese in packages, upon which is to be poured in a shallow dish a solution of sulphuric acid and water

At the present time carbolic acid is largely used as a disinfectant. It is certainly very efficacious.

Earth closets are now being introduced, and must in time become very popular.

"In the *commode*, the apparatus and earth reservoir are self-contained, and a movable pail takes the place of the vault. This must be emptied as often as necessary, and the contents may be applied to the garden or field, or be allowed to accumulate in a heap under cover until wanted for use. This accumulation is inodorous, and rapidly becomes dry. For use in bedrooms, hospital wards, infirmaries, &c., the commode is invaluable. *It is entirely free from those faint, depressing odors common to portable water-closets and night-stools;* and through its admission one of the greatest miseries of human life, the foul smells of the sick-room, and one of the most frequent means of communicating infection, may be entirely prevented. It is invariably found that if any failure takes place, it arises from the earth not being properly dry. Too much importance cannot be attached to this requirement."

NURSES.

When all the arrangements are completed in the sick-room, little benefit can be anticipated if a proper nurse be not obtained to render them available to the invalid. Before describing the qualifications requisite to constitute an efficient nurse, we cannot avoid embracing this opportunity of mentioning the great difficulty of procuring properly instructed nurses in this country. It is, indeed, to be greatly lamented, that, amidst the numerous improvements which characterize the present era, the females who assume to themselves the character of sick nurses, and are employed as such, are still left to acquire information, respecting the important duties which their office demands, from imperfect experience, or from accident. We expect that the skill of our medical attendants shall be certified by diplomas and licences before they are permitted to practice; but we leave their orders to be executed by the ignorant and the prejudiced, who not only too often fail in performing what they are ordered, but who, with the usual temerity of ignorance, presume to oppose their own opinions to those of the physician.

In hiring a sick-nurse, the qualifications which should regulate our choice, refer to *age*, *strength*, *health*, *temper*, *disposition*, *habits*, and *education*.

1. *Age*. She should not be under twenty-five, nor above fifty

years of age. This period is fixed upon, on account both of the physical powers and the moral conduct of the individual. Under twenty-five, the strength of a woman has not reached its maturity, and is scarcely adequate for lifting patients in and out of bed, and for many other duties which require strength, connected with the office of a nurse; but the strength and the muscular power in females begin to fail after fifty-five, when the natural transition from maturity to decay takes place. There is also a greater proneness to disease at this age than in the middle period of life.

2. *Strength.* Whilst strength is requisite, the frame should be such as to indicate activity. The stature should not exceed the medium degree; a little below this being less exceptionable than a little above it, provided the appearance displays a frame well knit together. Obesity and a heavy movement are objections, as they are frequently connected with self-indulgence, defective energy, and an inability to keep awake, or to be easily aroused from sleep.

3. *Health.* None of the qualifications of a sick-nurse are of more importance than health. An individual who herself requires attention is ill calculated to attend upon others.

4. *Temper and Disposition.* It is scarcely requisite to say that an attendant upon the sick should possess a happy, cheerful, equal flow of spirits; a temper not easily ruffled; and kind and sympathetic feelings; but, at the same time, not such as to interfere with firmness of character.

When the mind is weakened, and the nervous system morbidly susceptible, a harsh look or an unkind expression sinks deep into the mind of the invalid; and when the disease is of a nervous kind, a melancholy, anxious, or forboding look, or one which in any degree indicates an apprehension of danger, either in the physician or the nurse, instantly excites alarm in the mind of the invalid; and may counteract, in a great measure, the influence of the medical treatment.

On the other hand, a collected, cheerful expression of countenance, in the attendant on the sick, is likely to inspire hope, and to aid the efforts of the physician for the recovery of his patient.

The general disposition of a sick-nurse should be obliging. Every little office which the invalid may require to be done, should be performed at once, and without the smallest apparent reluctance, even when the necessity for its immediate performance is not absolute. There is also an earnestness of manner, which should, if possible, be obtained, or acquiesced in, by the sick-nurse; as it impresses the idea that she feels deeply interested in the case; a circumstance which is always highly appreciated by the patient.

With respect to gossiping, it is a detestable habit under any circumstances; but, in a nurse, it may be productive of the greatest danger, produce family feuds, and a thousand other evils.

5. In her *habits*, a sick-nurse should be sober, active, orderly, and clean and neat in her person.

The *activity* essential for a good nurse does not imply a bustling or fidgety manner, but a quiet, steady method of proceeding in the performance of her duties, equally devoid of fluster, turbulence, or noise. This activity is generally associated with orderly habits; a most valuable qualification, and without which the sick-room becomes a scene of confusion and disgust. Every medical man must have witnessed this state of disorder with regret: when, on visiting his patient, he finds no chair to sit upon, until some article of bedding, or of clothing, be removed from it, and the seat dusted with the apron of the nurse; and when a former prescription, or any thing else, is wanted, he must wait until the nurse rummages out half a dozen of drawers in search of it.

Another quality, usually conjoined with activity and orderly habits in a nurse, is cleanliness in her own person, and in that of her charge, as well as that of the sick-room. The dress of a nurse should be simple and neat, without trimmings. Nothing is more out of place than a fine lady attempting to perform the duties of a nurse. Whatever may be the stuff of which it is made, the apron should have pockets in it, in the fashion of the Parisian servants. Neither the gown, nor any of the outer garments, however, should be woolen, especially if the disease be infectious; as owing to its spongy tissue, woolen is apt to absorb and retain the infection. When the disease is decidedly infectious, the apron of the nurse should be made of glazed calico, or oiled silk.

Every nurse should be able to read and write. The better informed, the less likely is she to be biased by low prejudices. A nurse, also, who cannot read, may be the cause of much mischief in the administration of medicines.

The term "*an experienced nurse*," is supposed to comprehend every good quality. Experience deserves to be much and justly prized in a nurse, were the term not too frequently misapplied, and confidence placed in the nurse merely because she is advanced in years and has seen much, without any inquiry as to her capacity for observing, and making a proper use of what she has seen. Number of years and much opportunity are not a guaranty of wisdom nor of true experience. Age may undoubtedly be supposed to afford the means of enlarging the ideas; but every one is not endowed with the power of benefiting by the best opportunities; and it is here that the advan tages of education are displayed in the nurse. Without it, seventy years may have only added to her sum of stupidity. The poor woman has had eyes; but she has never fixed them with attention upon what was before them; and when she has accidentally observed, having no capacity for generalization, the observations, like most isolated facts, have been lost. She is a mere creature of routine; a machine moved by custom or prejudice; whereas the properly educated nurse acquires the power of observing and comparing, and consequently of reflecting and drawing proper conclusions.

COOKERY FOR THE SICK AND THE CONVALESCENT.

The cookery for the sick and the convalescent is confined to the simple processes of *boiling*, *baking*, and *roasting*. Before entering into the details of Sick-room Cookery, therefore, it will be useful to offer a few remarks upon the principles which render these processes serviceable in the preparation of food.

1. *Boiling* softens the animal fibre, and enables it to be more readily and effectually acted upon by the juices of the stomach; but, at the same time, it robs it of some of those nutritive matters which are soluble in boiling water. Much depends, however, on the slow or the rapid manner in which the process is conducted. If the boiling be too quick, it coagulates the albuminous matter of the meat, renders the flesh on the outside hard, whilst the interior is not sufficiently done; consequently, quick boiling diminishes its digestibility. In boiling meat, the water should scarcely be brought to the boiling temperature; and it should be long kept at a lower than a boiling point of heat, or at that state which approaches more to simmering than to boiling. Every kind of meat for invalids, except poultry, should be put on the fire with cold water, and very slowly boiled.

The nature of the water is also of some importance. Beef or mutton boiled in hard water is always more tender and juicy than when soft water is employed; a fact, probably, depending on the solvent properties of the water increasing in the ratio of its density. Fish, on the contrary, is rendered firm in the ratio of the hardness of the water in which it is boiled. Hence, fish boiled in sea-water, or in water containing much salt, is always firmer and more highly-flavored than that which is boiled in soft water, or water without salt.

Vegetables require rain or soft water, with the addition of salt.

In general, they are rendered indigestible from being too little boiled. This is especially the case with respect to the cabbage, the cauliflower, brocoli, turnips, and peas; which, too frequently, are cooked rather to please the eye than to afford nutriment. For the sick-room, vegetables should be boiled in two waters; when too little boiled, they prove highly injurious.

2. *Stewing* requires the heat to be kept under the boiling point; and a small quantity of water only is required. It softens the meat, and renders it more readily acted upon by the juices of the stomach than when it is boiled; stewed meat, therefore, is a good form of cookery for the convalescent.

3. The process of *Baking* is inadmissible for the preparation of animal food for either the sick or the convalescent; but it may be employed in the preparation of light puddings for the latter. The surface of the puddings, however, should not be browned by the aid of butter.

4. *Roasting* softens the tendinous parts of animal food better than boiling, and it retains more of the nutritive principles of the meat; hence, if the meat be neither too little nor too much done, roasted is more nutritive than boiled meat; but it is less easily digested. This fact is demonstrated by the comparative loss which takes place in these two modes of cooking. It has been ascertained that mutton loses one-fifth and beef one-fourth of its weight by boiling; but both lose only a little more than one-sixth in the process of roasting. The digestibility of the meat, however, being in the ratio of the softness of the fibre, that property is increased by slow boiling. It has, of late years, been much the fashion to regard under-done roasted meat well adapted for weak stomachs; but no opinion is more erroneous.

The processes of *frying* and *broiling* are wholly incompatible in cookery for the sick-room.*

The cookery for those actually suffering under the pressure of disease differs considerably from that which is required to repair the ravages of previous illness, and to restore the vigor and the strength of the body in convalescence. The following directions are, therefore, arranged under two distinct heads, namely,

1. Cookery for the Sick-room.
2. Cookery for Convalescents.

1. The *cookery for the sick-room* comprehends *farinaceous preparations*, *animal teas*, *broths*, *milks*, and *drinks*.

FARINACEOUS PREPARATIONS.

The whole of these may be regarded as modifications of starch.

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* Vide Human Health, by R. Dunglison, M. D.

more or less pure. They are not capable of conveying much nourishment into the habit; and being mild, and completely devoid of stimulant properties, they are well calculated for the sick.

ARROW-ROOT MUCILAGE.

Arrow-root is a white, inodorous, insipid, light powder, procured from the tubers of the Maranta *arundinacea*, or arrow-root plant, and manufactured in the East and West-Indies, of which it is a native.[*] The powder is a pure starch, which, although insoluble in cold water, yet forms a mucilage with boiling water. This *mucilage* is made by rubbing the *arrow-root powder* with a little cold water in a basin, by means of the back of a spoon, until it is completely mixed with the water; then pouring boiling water over it, at the same time stirring it assiduously until a soft, gelatinous, tenacious mucilage is formed; and, lastly, boiling it for five minutes. A table-spoonful of the *arrow-root powder* is sufficient to make a pint of the mucilage. It may be moderately sweetened, and rendered more palatable by the addition of a little lemon-juice; but cinnamon powder, or any astringent substance, precipitates the starch, and destroys the smoothness of the mucilage; hence, if wine be ordered with it, Port-wine should not be used.

TOUS LES MOIS.

This is a species of starch prepared from the rhizomes or tubers of some species of Canna, either C. *edulis*, or *coccinea*, both of which are natives of Peru. It is converted into a mucilage, and used in the same manner as arrow-root, over which it possesses no superiority. The great advantage of both, indeed, as articles of diet for the sick, depends on the small quantity of nutriment which they convey into the habit. It is often useful to satisfy the prejudices of the friends of invalids, by the appearance of supplying nourishment, when it would prove injurious.

MUCILAGE OF SAGO.

Sago[†] is the pith of several species of Palms and Cycadeæ, natives of tropical climates: the best is that made by the Chinese at Malacca, and known in commerce by the name of *Pearl Sago* It resembles roundish seeds, of a brownish-grey color, passing to pearl-white, or brick-red passing into dull-white. When soaked in water, at a moderate temperature, it absorbs from five to ten times its weight of water, swells, and becomes transparent. It consists of starch, with a small proportion of salt.

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[*] In the island of Portland, the farina of the roots of the Arum *maculatum*, cuckow-pint, which grows abundantly there, is manufactured into starch, and sold under the name of British arrow-root. Much potato starch is also sold as arrow-root. The fraud, however, is not a hurtful one, as the properties of these starches do not materially differ. Potato starch mucilage sooner becomes sour than arrow-root mucilage.

[†] There are three varieties of Sago known in European commerce; namely—*Sago of the Maldives*, in brownish-grey grains, possessing few of the chemical properties of starch; 2, *Sago of New Guinea*, in grains of a brick-red hue, passing to dull white; it is a nearly pure starch; 3, *Malacca Sago*, of which there are three kinds—*a*, in fawn-colored grains,

To make Sago into a proper *Mucilage* for the sick, an ounce or a table-spoonful of it should be macerated in a pint of water, in a pan placed on the stove, or on a *hot plate*, for two hours, and then boiled for fifteen minutes, stirring assiduously during the boiling. The Mucilage may be sweetened with *sugar*, and flavored with *lemon-juice;* or *milk* may be added to it, according to circumstances. Like other farinaceous mucilages, it affords very little nourishment; and is, therefore, well adapted for invalids laboring under acute diseases

MUCILAGE OF TAPIOCA.

Tapioca is the pith of the roots of Jatropha *Manihot*, a native of Brazil, which, although combined with a poisonous principle in the fresh state, yet is easily freed from it by washing in cold water, after the roots are barked and crushed. The fecula is then dried and granulated. It resembles Sago; but it is less colored and in larger grains.

The mucilage of tapioca is prepared in the same manner as that of sago, and with the same proportions of tapioca and water; but tapioca is more soluble than sago, and, consequently, it requires only half the time for its maceration and boiling. It forms a semi-opaque mucilage, which may be sweetened and flavored in the same manner as sago.

MUCILAGE OF SALEP.

Salep is prepared from the cormi or bulbs of the Orchis *mascula*. It is imported chiefly from the Levant; but some is brought from India. It consists of a peculiar kind of gum, termed Bassorin, and Fecula. It is more nutritive than either Arrow-root or Sago. and consequently is better adapted for the convalescent than for the sick. The mucilage is prepared by dissolving the powdered Salep in hot water, with assiduous stirring, and adding to the solution sugar and milk.*

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passing into grey; a pure starch, containing more salt than the other varieties; *b*, in rose-colored grains, in chemical characters the same as the former; *c*, in white grains, a very pure starch.

* Dr. Percival states that a mixture of Salep and flour makes excellent bread.—*Med. and Experimental Essays.*

GRIT-GRUEL.

Take three ounces of *Grits*,* wash them well in *cold* water, and, having poured off the fluid, put them into four pints of *fresh* water, and boil slowly, until the water be reduced one-half; then strain the whole through a sieve, to separate the mucilage from the undissolved part of the Grits.

OAT-MEAL GRUEL.

Take two ounces of *Oat-meal*, free from mustiness, and a pint and a half of *soft* water. Rub the meal in a basin, with the back of a spoon, in a moderate quantity of the water, pouring off the fluid after the grosser particles have subsided, but whilst the milkiness continues; and let this operation be repeated until no more milkiness is communicated to the water. Next put the washings into a pan, after having stirred them well, in order to suspend any fecula which may have subsided; and boil until a soft, thick mucilage is formed.

Both the gruel of grits and of oat-meal consist not only of the starch of the oat, but also of a small proportion of gluten; on which account, they are more nutritive than any of the feculaceous mucilages. They may be sweetened and acidulated, or mixed with milk, according to circumstances. Butter and honey, which are frequently added to these gruels, are inadmissible in inflammatory diseases.

Besides being excellent demulcent articles of diet, these gruels are usually employed as the vehicles for administering substances in the form of clyster; for which purpose they are better adapted than the purer starches, as they are not so susceptible of precipitation by astringent vegetable infusions and decoctions.

Gruel is apt to ferment when it is kept longer than twenty-four hours.

MUCILAGE OR JELLY OF ICELAND MOSS.

The *Iceland Moss* is a Lichen, named Cetraria *Islandica*, which grows on mountains, exposed situations in Iceland; in the north of Germany; and in other northern countries. It contains a bitter principle, which is useful, as a medicinal agent, in some diseases, but from which it should be freed, when it is to be employed as diet This is to be effected by pounding the dried Lichen, and soaking it for twenty-four hours in tepid water containing a small quantity of carbonate of soda, and then pressing it forcibly in a coarse cloth; after which, if any bitterness remain, the process must be repeated.

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* These are Oats freed from their cuticle or testa, and coarsely broken.

The Lichen, thus treated, is next to be put into water, in the proportion of *an ounce* to *a quart* of water; then slowly boiled down till one half the fluid is evaporated; and, lastly, strained through a sieve. The mucilage may be sweetened and acidulated; or it may be mixed with milk, in the same manner as the mucilages already noticed.

Any portion of the bitter may be separated by regulating the period of the maceration. When the bitter is not objectionable, it has one advantage; namely, that of enabling the stomach to digest more readily the mucilage, by the tone which it affords to that organ. The idea that it possesses any specific medicinal virtue for the cure of consumption is erroneous.

MUCILAGE OF CARRAGEEN—IRISH MOSS.

Carrageen is a Fucus, the Chondrus *crispus*, which grows upon rocks and stones in the sea, and is very common on the Irish coast. It has a tough, horny, flexible, crisp appearance; it almost wholly dissolves in water during boiling. One ounce of it, boiled in a pint and a half of water, is sufficient to form a semi-transparent, moderately consistent, nearly tasteless jelly; which, when sweetened and acidulated, or when mixed with milk, forms an excellent diet for invalids who require to have the strength supported.

MUCILAGE OF RICE.

Take one ounce of good Carolina rice, and, having washed it, macerate it for three hours in a quart of tepid soft-water, in a pan placed upon the stove, then boil the whole slowly for another hour, and strain through a sieve.

This mucilage may be sweetened and acidulated, or mixed with milk, in the same manner as the other feculaceous mucilages. It forms an excellent demulcent diet for the sick, especially in irritable conditions of the intestinal canal, and in diarrhœa; but it is a mistake to suppose that it possesses any astringent property.

The soluble part of rice is chiefly starch, which it contains in the proportion of eighty-five parts in the hundred. The less soluble parts are about five per cent. of parenchymatous matter; an animalized principle, amounting to rather more than three and a half per cent.; and some phosphate of lime. It is the animalized matter that affords any nutritive property which the rice possesses; but this is not taken up by the water in the above preparation; consequently, in a nutritious point of view, it is on an equality with the foregoing mucilages.

GROUND RICE.

Take a table-spoonful of ground rice, a pint and a half of milk, and half an ounce of candied lemon-peel. Rub the rice smooth with the milk, then add the lemon-peel cut into small pieces; boil for half an hour, and strain whilst the milk is hot.

This is an excellent nutritious beverage for the sick, when strict abstinence is not required; and for early convalescence.

SIMPLE BREAD PANADA.

Put any quantity of grated, stale bread into enough of water to form a moderately thick pulp; cover it up and let it soak for an hour; then beat it up with two table-spoonsful of milk, and a small portion of refined sugar, and boil the whole for ten minutes, stirring all the time.

This may be eaten by the sick, laboring under any disease in which abstinence is not strictly enjoined.

ANIMAL PREPARATIONS

HARTSHORN JELLY.

Take *six ounces* of hartshorn shavings, cut into small pieces; boil them in *four pints* of water down to *two pints;* strain, and add to the liquor, whilst hot, *two table-spoonsful* of lemon-juice, *six ounces* of white sugar, and *two glasses* of Sherry wine. This forms an excellent light nutriment for the sick and convalescent, when wine is not improper. Without the acid and the wine, but with an equal quantity of milk, it is an excellent substitute for the breast-milk, for infants who are unfortunately brought up by hand.

BEEF-TEA.

Take *half a pound* of good rump steak, cut it into *thin* slices, and spread these in a hollow dish; sprinkle a little salt over them, and pour upon the whole a *pint* of boiling water. Having done this, cover the dish with a plate, and place it near the fire for an hour; then throw the sliced beef and the water into a pan, cover it, and boil for fifteen minutes; after which, throw the whole contents of the pan upon a sieve, so as to separate the beef-tea from the meat.

The quantity of water directed to be used is too little for the strength of the beef-tea usually proper for invalids; but it is sufficient to extract all the soluble matter of the beef; and tea can be reduced to the strength required by the addition of boiling water.

1001. *Liebig's Beef-tea.*—"One pound of lean beef, free of fat and separated from the bones, in the finely chopped state in which it is used for mince-meat, is uniformly mixed with its own weight of cold water slowly heated to boiling; and the liquid, after boiling briskly for a minute or two, is strained through a towel from the coagulated albumen and fibrin, now become hard and horny. Thus we obtain an equal weight of the most aromatic soup, of such strength as cannot be obtained even by boiling for hours from a piece of flesh." This is to be seasoned to taste.

1003. *Marcet's New Process of Beef-tea.*—"Take one pound of lean beef, cut into small pieces; put into a pint of cold water. To this add:

Hydrochloric Acid (sp. gr. 1.15)..........	58 grains, or about 50 minims,
Boudault's Pepsine....................	50 grains.

"Bring it up to about 100° Fahrenheit, and maintain it at that temperature in a water-bath until the meat becomes disintegrated; then strain it, and neutralize with 80 grains of bicarbonate of soda.

"This makes a palatable and exceedingly digestible nourishment. In cases of fever, where the acid is rather desirable than not, the editor has found it quite agreeable to the patient, without the addition of the soda."

1004. *Eggs, Cream, and Extract of Beef.*—"Wash two ounces of the best pearl sago, until the water poured from it is clear; then stew it in a half pint of water until it is quite tender and very thick; mix with it half a pint of good boiling cream and the yolk of four fresh eggs, and mingle the whole carefully with one quart of good beef-tea, which should be boiling. Let cool sufficiently when it is ready for use."—*Ellis.*

CHICKEN-TEA.

Take a small chicken, free it from the skin and from all the fat between the muscles; and having divided it longitudinally into two halves, remove the whole of the lungs, the liver, and everything adhering to the back and the side bones. Then cut it, bones and muscles, by means of a strong, sharp knife, into as thin slices as possible; and, having put these into a pan with a sufficient quantity of salt, pour over them a quart of boiling water, cover the pan, and simmer, with a slow fire, for two hours; lastly, put the pan upon the stove for half an hour, and strain off the tea through a sieve.

Both of these animal decoctions are of a strength proper for any invalid whose condition, during the progress of actual disease, admits of animal diet in its lightest form. When concentrated with some farinaceous additions, and slightly spiced, they are equally useful in convalescence.

VEAL-TEA.

This may be made in the same manner as beef-tea, using a pound of fillet of veal, free from fat and sliced, and a *pint and a half* of boiling water, and boiling for *half an hour* instead of *fifteen minutes.* It may, also, be made with the same quantity of the fleshy part of a knuckle of veal.

By boiling down the knuckle-of-veal tea, whilst the meat is in it, to one-half, and straining, the decoction gelatinizes; and, when it is poured into small cups, it will keep good for several days. By adding an equal quantity, or more, of *boiling* water to a cupful of this jelly, a moderate quantity of veal-tea for one individual is prepared in two minutes.

MUTTON-TEA.

This is prepared with a pound of good mutton, freed from the fat and cut into thin slices, and a pint and a half of boiling soft water poured over it, in the same manner as for beef-tea; but it requires to be boiled, after the maceration, for half an hour, before it is strained through a sieve.

If the invalid desires the addition of barley, an ounce of good pearl barley, washed and macerated in boiling water for an hour, may be boiled with the mutton-tea, and the undissolved barley separated on straining.

1011.—CHICKEN BROTH.

"Clean half of a chicken, and pour on it one quart of cold water; add a little salt and one tablespoonful of rice; cover the vessel closely, and boil for two hours; throw in near the end of the boiling a little parsley, chopped fine; skim the broth before using.

" This is one of the most valuable articles of diet at the command of the physician in the low stages of disease, when the patient's system requires support, but his digestive powers will not admit of solid food."—*Ellis.*

1014.—MULLED WINE.

"Take two drachms of bruised cinnamon, half a nutmeg grated, ten bruised cloves, and half a pint of boiling water; infuse one hour; strain, and add of hot port or hot sherry wine (or of good domestic wine) one pint, and white sugar, one ounce. Mix.

"This is a mild stimulant drink, used in the convalescence from low forms of disease."—*Ellis.*

TURTLE-SOUP.

Plain turtle-soup, made from the green turtle, *Chelonia mydas*, without wine or spices, is sold in pots, and requires only the addition of water to reduce it to a proper consistence for the use of the sick and convalescents. It is extremely nutritious, and of very easy digestion; but it should be given only in small quantities, at moderate intervals. In cases of great debility, the consequence of long continued chronic diseases, either wine or brandy may be added to the soup; but the propriety of such an addition, and the quantity requisite in each case, must be left to the judgment of the medical attendant.

PREPARATION OF BEVERAGES.

DISTILLED WATER.

This, the purest state of water, may be readily obtained by fixing a curved tin tube, three or four feet long, to the spout of a tea-kettle, and conducting its free end into a jar placed in a basin of cold water, and enveloped with a wet towel. The steam thus condensed is distilled water. The softer the water is, the better solvent it is of all soluble animal and vegetable substances; and distilled water, being free from every foreign ingredient, is necessarily the softest of all water, and consequently the best adapted, not only for diluting in febrile affections, but for pervading the minutest vessels, and improving their secreting powers. Its use is recommended in diseases of the kidneys, in gout, scrofula, consumption, and cancerous affections.

Distilled water is mawkish to the taste; but this is easily corrected by pouring it from one jug to another, successively, for ten or fifteen minutes, so as to involve in it a quantity of atmospheric air.

The temperature of water, when low, is most agreeable to the palate, yet it should approach to that of the body; and, therefore, when the diluent influence only of water is required its temperature should not be under 60 deg., nor above 70 deg. When the heat of the body, however, is considerable, and the skin dry, in febrile diseases, water at as low a temperature as it can be obtained in the fluid state may be used.

TOAST-WATER.

Toast thoroughly, but not to a cinder, half a slice of a loaf, of the usual size and of a day or two old, put it into a jug, and pour over it a quart of water which has been boiled and cooled; and, after two hours, pour off the water gently from the bread. A small piece of orange or of lemon-peel, put into the jug at the same time as the bread, is a great improvement to toast-water.

The toast, in this case, communicates taste and color to the water, without affecting its diluent properties. The reason for employing water which has been boiled is to bring the fluid as near as possible to the state of distilled water.

Toast-water may be used at will in every febrile affection. It diminishes the heat of the mouth, the throat, and the stomach; and, by sympathy, that of the whole body.

APPLE-TEA OR WATER.

Slice two large, not over ripe, apples, and pour over the slices a pint of boiling water. After an hour, pour off the fluid, and, if necessary, sweeten with a moderate quantity of refined sugar.

LEMON-PEEL TEA OR WATER.

Pare the rind of one lemon, which has been previously rubbed, with half an ounce of refined loaf sugar, put the peelings and the sugar into a jar, and pour over them a quart of boiling water. When cold, pour off the fluid, and add one table-spoonful of lemon-juice. If wine be not improper, a glass of Sherry may be added, instead of the lemon-juice.

ORGEAT.

Blanch two ounces of sweet almonds, and four bitter almonds Beat them in a mortar with a little orange-flower water into a paste, and rub this with a pint of milk diluted with a pint of water, until an emulsion is formed. Strain, and sweeten with sugar. The Bitter Almond, when treated with water, develops a volatile oil, which has the odor of the peach-blossom, and contains prussic acid. In some individuals, the bitter almond causes an eruption on the skin, closely resembling nettle-rash; consequently this fact should be ascertained in reference to the individual for whom the orgeat is intended, before it be ordered.

RASPBERRY VINEGAR WATER.

This is merely diluted raspberry vinegar. It is generally made too acid.

All of these drinks are good diluents in fever, and may be taken at the pleasure of the invalid.

LEMONADE.

Take the juice of two lemons; add it to a quart of boiling water, having the rind of one of the lemons in it, in a covered jar, and sweeten it moderately with refined sugar.

BARLEY-WATER.

Simple Barley-Water.—Take two ounces and a half of pearl barley, and four pints and a half of soft water. Wash first the barley with cold water, to remove from it every foreign matter; and then pour upon it half a pint of the water, and boil for fifteen minutes. Throw this water away; and, having heated the four remaining pints of the fluid, pour them upon the barley, and boil down to two pints, and strain.

Compound Barley-Water.—"Take two pints of simple barley-water, two ounces and a half of figs, sliced; five drachms of liquorice root, sliced and bruised; two ounces and a half of raisins, and a pint of soft water. Boil down to two pints, and strain."

These decoctions are not only good demulcent diluents, but, in cases where a very moderate degree of nutriment is not objectionable, they answer the purpose of diet.

Simple barley-water, when mixed with an equal quantity of milk and a small portion of refined sugar, is a good substitute for the breast-milk, for infants who are brought up with the spoon.

When an ounce of gum is dissolved in a pint of simple barley-water, an excellent beverage is formed for cases of strangury from blistering plaster; and in gravel.

ALMOND EMULSION.

Take one ounce and a quarter of sweet almonds, blanched; five drachms of sugar; and a quart of soft water. Beat the almonds with the sugar, in a porcelain mortar, into a smooth pulp, adding the water gradually, and stirring assiduously until the whole of the fluid is added; then strain through linen.

An excellent demulcent in febrile affections.

MARSH-MALLOW TEA.

Take four ounces of dried roots of the marsh-mallow (Althœa *officinalis*); two ounces of raisins, freed from the seeds; and five pints of boiling water. Boil slowly down to three pints, and when the sediment has subsided, pour off the clear liquor.

This is an excellent demulcent drink in diseases of the kidney with a tendency to gravel.

FLAXSEED TEA.

Take an ounce of flaxseed, *not bruised;* two drachms of liquorice root, bruised; and one pint of boiling soft water. Place the jug containing these ingredients, covered, near the fire for four hours, and then strain through linen or cotton.

The mucilage resides in the husk, and the fixed oil in the kernel of the flaxseed; and, therefore, the seeds ought not to be bruised. When flaxseed is boiled, the fixed oil is extracted, and renders the decoction both nauseous and stimulant.

Flaxseed tea is a useful demulcent drink in coughs, and affections of the urinary organs; but it should be made daily, as it soon gets ropy, and spoils.

RENNET-WHEY.

Infuse a moderate-sized piece of rennet* in a sufficient quantity of boiling water to abstract all the soluble matter; separate the fluid, and stir a table-spoonful of it into three pints of milk; cover up the mixture with a clean cloth, and place it before the fire until it forms a uniform curd. Divide this curd with a spoon, and, pressing it gently, separate the whey.

Good whey should be nearly transparent, of a pale straw-yellow color, and should have a sweetish taste. It constitues ninety-two parts in one hundred of the milk; and, besides water, contains sugar of milk, and some salts. It is an excellent diluent in febrile affections. When boiled down to one half, it proves nutritive as well as diluent.

VINEGAR AND TAMARIND WHEYS.

A small wine-glassful of vinegar, sweetened with a dessert-spoonful of Muscovado sugar; or two table-spoonsful of tamarinds, stirred into a pint of boiling milk, and the whole boiled for fifteen minutes, and strained, form these wheys. They are useful refrigerant drinks in febrile diseases.

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* Rennet is a production of the inner or mucous membrane of the stomach of a calf. Its action in coagulating milk is not understood. It does not depend on the acid which the rennet contains; but on a peculiar substance, which has been named *Chymosine.* The quantity of liquid rennet necessary to curdle 1000 grains of milk is only eight drops; but it requires a heat of 68 deg. of Fahrenheit; and its action is aided by the acidity of the rennet.

WHITE WINE WHEY.

Take two-thirds of a pint of good milk, and dilute it with as much water as will make up the pint.

Take two glasses of sherry wine, or any other good white wine; and a dessert-spoonful of Muscovado sugar.

Place the milk and the water in a deep pan upon the fire; and, watching the moment when it boils, which is known by a scum rising to the edge of the pan, pour into it the wine and the sugar, and stir assiduously, whilst it continues to boil for twelve or fifteen minutes. Lastly, strain the whey through a sieve.

This is an excellent mode of administering wine in small quantities in low fevers, and in cases which demand a moderate degree of excitement. It may be drunk either cold or tepid, in a wineglassful at a time.

MUSTARD-WHEY.

Take half an ounce of bruised mustard seeds, and one pint of milk; boil them together until the milk is curdled, and strain to separate the whey.

This whey has been found to be a useful drink in dropsy; it stimulates the kidneys, and, consequently, augments the urinary secretion. It may be taken in a tea-cupful at a time.

MIXTURE OF SPIRIT OF FRENCH WINE.

Egg Brandy. Take four ounces of French brandy, four ounces of cinnamon water, the yelks of two eggs, half an ounce of purified lump sugar, and two drops of oil of cinnamon. Mix the yelks of the eggs first with the water, the oil, and the sugar, agitating assiduously; and then add the brandy by a little at a time, until a smooth fluid is formed.

This is an excellent mode of administering brandy in the sinking stage of Typhus and other low fevers.

ARTIFICIAL GOATS' MILK.

Take an ounce of fresh suet, cut into small pieces, and tie them in a muslin bag, large enough to leave the morsels free from compression; boil this in a quart of cow's milk, sweetened with a quarter of an ounce of white sugar-candy.

This is an excellent article of diet in scrofulous emaciation, especially when ordinary articles of food pass through the bowels nearly undigested. It is also useful in the later stages of pulmonary consumption. It may be used for infants who are unfortunately brought up by the spoon.

ARTIFICIAL ASSES' MILK.

Take half an ounce of gelatine; dissolve it, by the aid of heat, in a quart of barley-water; add one ounce of refined sugar; then pour into the mixture a pint of new milk, and beat up the whole with a whisk.

It should be drunk warm, and exercise taken after it. It may be also prepared by dissolving two ounces of sugar of milk in one pint of tepid skimmed cow's milk. These, however, are but poor substitutes for asses' milk; which is one of the best restoratives in convalescence from severe disease. When taken in too great quantity it is apt to cause diarrhœa.

MILK AND SODA WATER.

Heat, nearly to boiling, a tea-cupful of milk, and dissolve in it a tea-spoonful of refined sugar; put it into a large tumbler, and pour over it two-thirds of a bottle of good soda-water.

This is an excellent mode of taking milk when the stomach is charged with acid, and consequently is apt to feel oppressed by milk alone.

BUTTERMILK.

When buttermilk is newly churned, it is a wholesome, delicious, and cooling beverage in fever or any disease of excitement; but, as it cannot be procured in large towns, and not always in the country, the method of making it in small quantities, daily, should be understood. It is readily prepared by putting a quart of new Milk into a bottle which will hold half a gallon, corking the bottle, and covering it with a towel in such a manner, that, by drawing alternately each end of the towel, the bottle can be rolled upon a table. This movement should be continued until such time as all the butter is separated, which is known by its appearing in clots or masses swimming in the milk. During the rolling, it is necessary to open the bottle occasionally to admit fresh air into it, as that is essential for the formation of the butter. When the process is finished, all the butter should be carefully separated from the buttermilk.

Buttermilk may be drunk at pleasure.

SAGO POSSET.

Put two ounces of sago into a quart of water, and boil until a mucilage is formed; then rub half an ounce of loaf-sugar on the rind of a lemon, and put it, with a fluid drachm (a teaspoonful) of tincture of ginger, into half a pint of sherry wine; add this mixture to the sago mucilage, and boil the whole for five minutes.

This is an excellent cordial where acute diseases, not of an inflammatory kind, have left the body in a state of great debility. A large wine-glassful may be taken at once, at intervals of four or five hours.

COOKERY FOR THE CONVALESCENT.

This comprehends farinaceous and animal preparations of a more nutritious and stimulant nature than is admissible for the sick-room; but, at the same time, considerably within that which is usual and not improper in a state of health.

FARINACEOUS PREPARATIONS.

These are not solely modifications of starch; but they admit of the presence of gluten and other components of the *Cerealiæ.* They are rendered more nutritive by the addition of milk and other animal substances of a moderately stimulant character.

BOILED FLOUR AND MILK.

Knead any quantity of wheaten flour with water into a ball, and tie the whole firmly in a linen cloth; put it into a pan with water, and boil it slowly for twelve hours. Place it before the fire to dry; and afterwards, on removing the cloth, separate a thick skin, or rind, which has formed, and again dry the ball.

A table-spoonful or more of this, grated and boiled with a pint of milk, forms an excellent article of diet in convalescence from diarrhœa, or from dysentery, and in cases of emaciation.

ARROW-ROOT PUDDING.

Take a table-spoonful of arrow-root powder, rub it with a little cold water in the same manner as in making the mucilage, and add to it, stirring assiduously, a pint of boiling milk. With this mucilage, mix the contents of one egg, and three tea-spoonsful of powdered, refined sugar, which have been previously beaten up together. The pudding thus formed may be baked, or it may be boiled in a basin.

This is an excellent pudding for the early stage of convalescence For a more advanced period, a table-spoonful of Scotch orange-marmalade is a good and agreeable addition to this pudding.

ARROW-ROOT BLANC-MANGE.

Make the mucilage in the usual manner, using three times the quantity of the arrow-root powder; then add milk in a moderate proportion; and having boiled down the mixture to a sufficient degree of thickness, pour it into a shape to cool and set; after which it may be turned out.

In convalescence, this *blanc-mange* may be eaten with currant-jelly, or with wine or lemon-juice and sugar. It is sometimes eaten with cream; but such an addition is improper in convalescence

MILK OR BEEF-TEA ARROW-ROOT MUCILAGE.

This mucilage is made exactly in the same manner as the simple arrow-root mucilage, except that beef-tea, or milk, is used in the boiling state instead of water; and the mucilage is boiled for twenty minutes instead of five minutes.

Either of these preparations forms an excellent diet in the early stage of convalescence, and for delicate children.

FLUMMERY OR SOWANS.

Take a quart or any quantity of grits, or of oatmeal; rub the grits or the meal for a considerable time, with two quarts of hot water and leave the mixture for several days at rest, until it becomes sour; then add another quart of hot water, and strain through a hair sieve. Leave the strained fluid at rest until it deposits a white sediment, which is the starch of the oats; lastly, pour off the floating water, and wash the sediment with cold water. The washed sediment may be either boiled with fresh water, stirring the whole time it is boiling, until it forms a mucilage or jelly; or it may be dried, and afterwards, prepared in the same manner as arrow-root mucilage Flummery should not be made in a metallic vessel.

Flummery is light, moderately nutritious, and very digestible; it is, consequently, well adapted for early convalescence. It may be eaten with milk or with wine, or lemon-juice and sugar.

OAT-MEAL PORRIDGE.

Sprinkle into a pint of water, kept boiling, small quantities of oatmeal, at short intervals, stirring assiduously, until a moderately consistent mixture is formed; and continue to boil, afterwards, for half an hour.

Oatmeal porridge, eaten with milk, is a moderately nutritive diet, well adapted for early convalescence, when there is no dyspeptic tendency. When the stomach is deranged, it is apt to prove acescent, and is improper.

RICE AND APPLES, OR SNOW-BALLS.

Instead of preparing this dish in the usual manner—namely, cutting the apples, freed from the rind and internal seed-cells, into quarters longitudinally, then surrounding them with rice, and boiling the whole in cloths—it is preferable to boil the rice in hot water rapidly, and after straining off the water through a cullender, to expose it for ten or fifteen minutes before the fire, and having stewed the apples separate from the rice, to mix them together with a very moderate quantity of sugar.

The rice thus prepared is more digestible, and assuredly much more palatable, than when it is run together into a paste. Too much sugar is apt to disagree with the stomachs of convalescents, and induce an attack of dyspepsia. The butter which is often added to this dish is improper in convalescence. With these precautions, rice and stewed apples form a dish well adapted for invalids recovering from acute disease.

BOILED BREAD PUDDING.

Grate half a pound of stale bread, pour over it a pint of hot milk, and leave the mixture to soak for an hour in a covered basin; then beat it up with the yelks of two eggs. Put the whole into a covered basin, just large enough to hold it, which must be tied in a cloth, and placed in boiling water for half an hour. It may be eaten with salt or with sugar; and, if wine be allowed, it may be flavored with a glass of Sherry.

SIMPLE RICE PUDDING.

Wash two table-spoonsful of good Carolina rice, and simmer them in a pint and a half of milk, until the rice is soft; then add the contents of two eggs, beaten up with half an ounce of sugar. Bake it for three-quarters of an hour in a slow oven.

In an advanced state of convalescence, two glasses of Sherry to the pudding, before it is baked, is an agreeable addition.

MACARONI OR VERMICELLI PUDDING.

Take two ounces of macaroni or of vermicelli, a pint of milk, and two fluid ounces (four table-spoonsful) of cinnamon-water; simmer until the macaroni or vermicelli is tender. Next, beat up three yelks of eggs and the white of one egg, an ounce of sugar, one drop of the oil of bitter almonds, and a glass of Sherry wine, in half a pint of milk; and add the mixture to the macaroni or vermicelli. Bake in a slow oven.

BATTER PUDDING.

Take a table-spoonful of wheaten-flour, a pint of milk, the yelk of two eggs, and half an ounce of sugar. Beat the yelks of the eggs with the sugar, and mix them with the milk and flour. This pudding should be boiled, in a basin tied in a cloth, in boiling water.

TAPIOCA PUDDING.

Beat the yelks of two eggs and half an ounce of sugar together, and stir the mixture into a pint of tapioca mucilage made with milk. Bake in a slow oven.

Sago, *arrow-root*, or *millet-seed mucilage* may be converted into light puddings in the same manner.

In advanced convalescence, these puddings may be eaten with wine.

MASHED CARROTS AND TURNIPS.

Boil the turnips and the carrots, peeled, separately, in three successive waters; then press strongly the water out of them, through a clean coarse cloth. Mash them together with enough of new milk to form them into a pulp, and season with salt. Place them before the fire until the surface seems dry.

This is an admirable dish for convalescents who are restricted to farinaceous and vegetable diet; and it is one which invalids get fond of. The author once ate of this dish for dinner daily, in convalescence from a severe disease, for several months; and he now prefers it to every other kind of vegetable food.

PLAIN BOILED VEGETABLES.

Almost every kind of vegetable may be eaten by the convalescent, if it is well boiled. All the cabbage tribe, turnips, carrots, and onions should be thoroughly boiled in two waters. If salt be added, and the boiling be brisk, in an uncovered vessel, green vegetables do not lose their color; and, whilst by this means they are well boiled, they remain pleasant to the eye.

ANIMAL PREPARATIONS.

RICE OR VERMICELLI, OR MACARONI SOUP.

Make a quart of beef-tea, in the manner already described, and boil it down one third; then add to it an ounce of vermicelli, or two ounces of macaroni, which have been previously well boiled in water, and boil down the whole to one pint. The soup may be salted to the taste, and five grains of Cayenne pepper added to one pint of it; provided the condition of the invalid does not forbid the addition of so moderate a stimulant.

When rice is used instead of vermicelli or macaroni, it should be put into boiling water, and boiled rapidly in a close vessel; then thrown upon a cullender, and slightly dried before the fire. It should not be boiled with the soup, but added after the concentration of the soup, in quantity agreeable to the taste of the invalid.

This is an excellent soup for convalescents.

CHICKEN-BROTH.

When chicken-tea, is boiled down one half, with the addition of a little parsley or celery, and the yelk of an egg previously beat up in *two ounces* of *soft* water, it forms a soup much relished by the convalescent. It may be rendered still more palatable by the addition of some properly boiled rice, or vermicelli, or macaroni; and by the addition of *three or four grains* of Cayenne pepper, to a pint of the broth.

CHICKEN-PANADA.

Take the white meat of the breast and of the wings of a chicken which has been either boiled or roasted, free it from the skin, and cut it into small morsels; pound these in a mortar with an equal quantity of stale bread, and a sufficiency of salt; adding, by little and little, either the water in which the chicken was boiled, or some beef-tea, until the whole forms a thin, fluid paste: lastly, put it into a pan, and boil for ten minutes, stirring all the time.

A similar panada may be made with a slice from the under side of a cold sirloin of roasted beef; or from a leg of cold roasted mutton. Either should be freed from fat and skin; and the gravy, kept until the fat is thrown in a cake and separated, may be added to it.

This panada is a nutritive article of diet for convalescents and delicate children.

RICE AND GRAVY.

Take the gravy from a leg of roasted mutton, or from a sirloin of roasted beef; leave it at rest until the fat forms a cake on the surface; remove this; and stir into a tea-cupful of it as much well-boiled rice as will suffice for a meal. This is also a wholesome diet in early convalescence for delicate children.

GLOUCESTER JELLY.

Take of rice, pearl barley, sago, and gelatine, each an ounce;

simmer the whole in three pints of water until they are reduced to two pints, and strain. When cold, the decoction forms a strong jelly, which may be dissolved in warm milk or in beef-tea, or melted in hot water, and flavored with wine and sugar.

SAGO MILK.

Soak an ounce of sago in a pint of cold water for an hour, pour off this water, and add a pint and a half of good milk, and boil slowly until the sago is well incorporated with the milk.

MUTTON BROTH, WITH VEGETABLES.

Take a pound of mutton-chops, freed from the fat, put them into a pan with three pints of water and boil them slowly, and simmer them for two hours. Take three moderate-sized carrots and the same number of turnips, peel and cut them into slices; boil them for half an hour in a quart of water; then throw them upon a cullender to drain off the water; and, having boiled two onions, sliced, in a pint of water, and also poured off the water, add the turnips, the carrots, and the onions to the mutton liquor, after removing the mutton-chops. Season with salt and a little celery-seed. Simmer slowly for four hours, then put in the chops again, and continue the simmering for another hour. The chops may be dished up with the broth.

This is a palatable, and nutritive dish for convalescents; and, owing to the long and slow simmering, the mutton is rendered soluble and of easy digestion.

TRIPE.

Few things are more easily digested than tripe, when it is properly cooked. After partially boiling it in the usual manner, and also after boiling some onions in two waters, both should be slowly boiled together, until the tripe is very soft and tender. A sufficient quantity of salt, and a pinch or a few grains of Cayenne pepper, may be added.

SWEETBREADS.

These, when plainly cooked, are well adapted for the convalescent. They should be slowly boiled, and very moderately seasoned with salt and Cayenne pepper.

FOWL, WITH RICE.

Free a young fowl from the skin and the fat between the muscles on the surface of the body, and simmer it in good beef-tea, till it is very tender; season with salt only; and having boiled some rice as if for currie, add it to the liquor before the fowl is dished.

PREPARATIONS OF FISH.

WATER-SOUCHY.

Take two small fresh flounders, boil them in a quart of water to one-third, or long enough to reduce the fish to a pulp. Strain the liquor through a sieve, and, having cut the fins off four other small flounders, put them into the above-mentioned liquor, with a sufficient quantity of salt, a few grains of Cayenne pepper, and a small quantity of chopped parsley; and boil just long enough to render the fish proper to be eaten. The fish and the sauce should be eaten together.

If flounders are not in season, soles, or whitings, or small haddock, may be prepared in the same manner.

Few dishes are so much relished as this by convalescents from fever. Invalids sometimes ask for it daily for ten or more days. It is sufficiently nutritive, and very easily digested.

In advanced convalescence, the yelk of one or two eggs may be beaten up with a little soft water, and added to the strained liquor before the fish is put into it.

BROILED WHITINGS.

Broil the whitings without freeing them from the skin; and when they are sufficiently done, take out the back bone, and introduce a little cold butter in its place.

By cooking whitings in this manner, the juices of the fish are retained, and its nutritive property augmented. The fish thus cooked is of easy digestion, and well adapted for convalescents.

PREPARATION OF BEVERAGES.

AROMATIC BARLEY WINE.

Take a quart of barley-water, and boil it down one-third; then add to it, while it is hot, a pint of Sherry wine, a drachm of tincture of cinnamon, and an ounce of refined sugar.

A wine-glassful, two or three times a day, is a good cordial in convalescence attended with much debility.

MULLED WINE.

Take a quarter of an ounce of bruised cinnamon, half a nutmeg grated, and ten bruised cloves; infuse them in half a pint of boiling water for an hour, strain and add half an ounce of lump sugar; and pour the whole into a pint of hot port or sherry wine.

This is a useful cordial in the low stage of typhus fever. and in the debility of convalescence from fevers.

INFLUENCE OF THE OCCUPATIONS ON HEALTH AND LONGEVITY.

The subject is one that presents inherent difficulties in the investigation, although it is of vast importance and of peculiar interest. It involves questions that cannot be solved by theory alone, but which demand the largest possible amount of statistical information. Unfortunately, however, until of late years, very little effort has been made by statisticians to prepare tables of the relative mortality in different occupations.

But these, such as they are, gathered at different periods by candid and painstaking men, are of very great value.

It is obvious that health and longevity must depend very materially on the occupation. In civilized lands we all lead lives more or less artificial, shaping or narrowing our activities according to the varying demands of advancing society. "Lead a natural life" is a convenient form of rhetorical advice, but practically it can mean nothing more than to make the wisest selection of the benefits of civilization.

An ideal occupation, consisting in every way with the healthiest and most enduring development of all the faculties, would require four conditions:

1. It would admit of the harmonious development of the whole nation.
2. It would be congenial to the taste.
3. It would admit of system.
4. Its pursuits would be calm and unworried.

Now, it is evident that, taking the world as we find it, such an ideal occupation cannot exist; in no pursuit that men follow for maintenance, or even for dignity merely, is it possible to conform, any more than approximately, to the ideal laws of hygiene.

Such being the case, we are compelled to form our estimate of the comparative healthfulness of different occupations by the results of observation and statistics. Assuming that all the pursuits in which we are engaged are more or less removed from the ideal supposed, we ascertain by theory and calculation which are, on the whole, the most favorable to health and longevity.

Dr. Jarvis has prepared the following tabular statement of the average longevity in some leading occupations in Massachusetts, New York, and Rhode Island:

Occupations.	Deaths.	Average Longevity
Clergymen	389	55.36
Lawyers	276	54.26
Physicians	540	54.32
Coopers	338	57.04
Blacksmiths	822	51.51
Carpenters	2,052	49.72
Masons	492	48.29
Tanners	230	47.90
Merchants and clerks	2,386	47.46
Cabinet-makers	253	46.34
Shoemakers	3,233	43.03
Painters	500	43.37
Tailors	486	41.08

The Register of the city of Boston has the following table of ages of seven hundred and six men, in the principal professions and trades, who died in 1855:

		Av. age.			Av. age.
305	Laborers	40.30	45	Clerks	32.98
69	Mariners	38.59	20	Shoemakers	24.35
35	Tailors	39.08	15	Teamsters	34.40
32	Merchants	58.81	12	Gentlemen	59.83
32	Traders	49.68	11	Printers	39.45
33	Carpenters	45.76	10	Masons	40.20
22	Painters	40.36	9	Machinists	33.77
8	Farmers	57.12	8	Bakers	38.62
6	Ship-carpenters	51.16	7	Blacksmiths	35.00
5	Physicians	48.80	4	Curriers	28.50
5	Clergymen	53.80	4	Engineers	45.75
4	Coopers	40.50	5	Lawyers	60.20

In the twenty-second registration report of Massachusetts for 1866, I find a very carefully prepared table, showing the number and average ages of all persons over twenty years of age, whose occupations were specified, and whose deaths were registered during a period of twenty years and eight months, from May 1st, 1843, to December 31st, 1866. As the number of persons whose occupations and average ages are there given is upward of 95,000, this record is the most important contribution to vital statistics that has ever been made. I append the statistics of the most important representative employments. (See *Statistical Tables.*)

In the eleventh registration report of Rhode Island for 1863, the average ages of those who died during that year in that State are given, with their respective occupations, the ages under twenty being excluded.

As the whole number specified is less than eight hundred, the results are not very conclusive; in some of the trades only one or two cases of death are recorded. I select those that are of the greatest importance in a statistical point of view, omitting all such as do not present a sufficient number of deaths to be of value:—

Occupations.	No. of Persons.	Av. Age.
1. Agriculturists	147	65.22
2. Mechanics and artisans:		
Blacksmiths	13	60.84
Carpenters	24	57.37
Jewellers	12	39.41
Machinists	14	57.85
Shoemakers	12	53.91
Weavers	10	40.60
3. Laborers:		
Laborers	141	48.56
4. Business men:		
Manufacturers	10	47.80
Merchants	39	54.33
5. Seafaring men:		
Mariners	16	38.81

These are all the statistics in regard to the occupations of this country that I have been able to obtain, and are, I believe, all of any importance that exist, or have been prepared in the United States, with the exception of a few observations of the longevity of special classes, which will appear under their appropriate heads.

Let us now compare the reports of the English Registrar-General with that of Massachusetts and Rhode Island. The first registration report of England was published in 1838, since which time there has been continued progress in the system of arrangement and collation.

Dr. Caspar, of Berlin, and Dr. Guy, of London, both wrote on the subject of the relation of occupation to health and longevity; but, inasmuch as very few statistics had at that time been gathered, their speculations are of no great value. Ramazzini and Thackeray gave some advice to artisans by which they might in a measure counteract the evil effects of their callings.

But by far the best work on this subject that has yet appeared on either side of the Atlantic is a small book written by Dr. Thackrah, an eminent surgeon of Leeds, and published in 1832. Although he had few figures to aid him, his book is of great value, both for the compass and accuracy of its general observations, and for the originality and clearness of its ideas.

In 1857, Dr. Neison published a large work on vital statistics, the main object of which was to present the mortuary facts of the friendly societies of England, and also of the medical profession.

Dr. Farr, Registrar-General of England, in his fourteenth annual report, made some important statements in regard to the ages of men dying in different employments. From a careful examination of his tables, I am convinced that they are in the main corroborative of the experience of the registrars of Massachusetts and Rhode Island.

Of those that died in England in 1851, the different classes stand thus in order of mortality:—

1. Farmers.
2. Shoemakers.
3. Weavers.
4. Grocers.
5. Blacksmiths.
6. Carpenters.
7. Sailors.
8. Laborers.
9. Miners.
10. Bakers.
11. Butchers.
12. Innkeepers.

It thus appears that miners, bakers, butchers, and innkeepers experienced the heaviest mortality. In regard to the professions he states that the percentage of death is less or at least not greater than that of the average in all the employments, as we have seen to be the case in this country.

In Dr. Neison's report I find the following table, showing the expectation of life of the clerks, plumbers, bakers, and miners of the friendly societies of England:—

Ages.	Clerks.	Plumbers.	Bakers.	Miners.
20	31.83	36.50	40.02	40.67
30	27.57	30.50	32.35	33.15
40	21.83	24.30	24.07	24.42

OCCUPATIONS.

Distinguishing by Occupations (statistically classified) the Number, with their Average and Aggregate Ages, of Persons in the State (in two geographical divisions) whose Occupations were specified and whose Deaths were registered during the year 1866; *also in the State (entire) during the period of Twenty-three Years and Eight Months, ending with December* 31, 1866.

[This table includes only persons over twenty years of age.*]

OCCUPATIONS.	NINE EASTERN COUNTIES, 1866.			FIVE WESTERN COUNTIES, 1866.			WHOLE STATE, Twenty-three Years and Eight Mos. From May 1, 1843, to Dec. 31, 1866.		
	Number of Persons.	Ages.		Number of Persons.	Ages.		Number of Persons.	Ages.	
		Aggregate.	Average.		Aggregate.	Average.		Aggregate.	Average.
ALL CLASSES OF OCCUPATIONS	3,718	189,182	50.88	1,501	80,332	53.52	95,918	4,828,120	50.34
I. CULTIVATORS OF THE EARTH	562	37,417	66.57	541	35,055	64.80	22,764	1,461,288	64.40
II. ACTIVE MECHANICS ABROAD	286	15,612	54.59	68	3,962	58.26	6,893	351,855	51.04
III. ACTIVE MECHANICS IN SHOPS	482	22,410	46.49	195	9,314	47.76	9,898	474,399	47.93
IV. INACTIVE MECHANICS IN SHOPS	483	21,025	43.52	146	6,335	43.39	10,855	465,594	42.89
V. LABORERS—NO SPECIAL TRADES	727	37,274	51.27	269	12,994	48.30	17,764	825,852	46.49
VI. FACTORS LABORING ABROAD	165	6,771	41.04	40	1,588	39.70	4,978	172,806	34.71
VII. EMPLOYED ON THE OCEAN	341	15,856	46.50	2	52	26.00	6,160	279,532	45.38
VIII. MERCHANTS, FINANCIERS, CAPITALISTS	460	22,679	49.30	124	5,853	47.20	9,220	445,410	48.26
IX. PROFESSIONAL MEN	140	7,284	52.03	61	3,298	54.07	3,316	166,953	50.35
X. FEMALES	72	2,854	39.65	55	1,881	34.20	4,070	184,431	45.31
I. CULTIVATORS OF THE EARTH	562	37,417	66.57	541	35,055	64.80	22,764	1,460,288	64.15
II. ACTIVE MECHANICS ABROAD	286	15,612	54.59	68	3,962	58.26	6,893	351,855	51.04
Brickmakers	5	223	44.60	1	34	34.00	65	3,161	48.63
Carpenters	140	7,583	54.16	46	2,666	57.96	3,852	197,234	51.20
Caulkers and Gravers	9	502	55.77	–	–	–	122	7,156	58.65

Masons	34	1,911	56.20	10	682	68.20	980	48,862	49.86
Millwrights	3	237	79.00	1	61	61.00	91	5,176	56.88
Riggers	2	71	35.00	-	-	-	113	6,780	60.00
Ship-Carpenters	31	2,070	66.83	-	-	-	602	34,408	57.16
Slaters	5	182	36.40	1	32	32.00	23	868	37.74
Stonecutters	41	1,960	47.80	7	403	57.57	597	27,428	45.94
Tanners	16	873	54.56	2	84	42.00	448	21,782	48.62
III. ACTIVE MECHANICS IN SHOPS	482	22,410	46.49	195	9,314	47.76	9,898	474,399	47.93
Bakers	15	740	49.33	1	53	53.00	302	13,823	45.77
Blacksmiths	50	2,389	47.48	24	1,334	55.58	1,655	87,203	52.69
Brewers	3	162	54.00	-	-	-	13	720	55.38
Cabinet-makers	27	1,412	52.29	2	99	49.50	493	24,036	48.75
Calico-printers	-	-	-	-	-	-	9	469	52.11
Card-makers	-	-	-	-	-	-	31	1,406	43.35
Carriage-makers	8	346	43.25	1	57	57.00	159	8,001	50.32
Chair-makers	1	84	84.00	8	373	46.62	70	2,963	42.33
Clothiers	-	-	-	1	80	80.00	63	3,587	56.94
Confectioners	3	111	37.00	-	-	-	40	1,619	40.47
Cooks	8	280	35.00	-	-	-	68	2,703	39.75
Coopers	24	1,393	58.04	2	106	53.00	647	38,278	59.16
Coppersmiths	-	-	-	-	-	-	67	3,156	47.10
Curriers	8	361	45.12	4	241	60.25	109	4,755	43.62
Cutlers	4	198	49.50	3	140	46.67	77	2,984	38.75
Distillers	1	69	69.00	-	-	-	20	1,128	56.40
Dyers	5	264	52.80	4	190	47.50	94	4,126	43.89
Founders	17	783	46.05	11	386	35.09	187	8,356	44.66
Furnace-men	5	328	65.60	-	-	-	69	2,944	42.67
Glass-blowers	6	284	47.33	1	34	34.00	93	3,606	38.77
Gunsmiths	-	-	-	2	78	39.00	221	10,538	47.68
Hatters	13	625	48.07	3	202	67.33	258	14,135	54.79
Leather-dressers	6	247	41.16	-	-	-	100	4,556	45.56
Machinists	71	2,808	39.54	28	1,247	44.54	1,233	49,441	40.09

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* Soldiers and females excepted.

OCCUPATIONS.—Continued.

OCCUPATIONS.	NINE EASTERN COUNTIES, 1866.			FIVE WESTERN COUNTIES, 1866.			WHOLE STATE, Twenty-three Years and Eight Mos. From May 1, 1848, to Dec. 31, 1866.		
	Number of Persons.	Ages.		Number of Persons.	Ages.		Number of Persons.	Ages.	
		Aggregate.	Average.		Aggregate.	Average.		Aggregate.	Average.
Millers	7	388	55.42	3	169	56.33	186	10,896	58.58
Musical Instrument-makers	1	70	70.00	–	–	–	10	390	39.00
Nail-makers	10	438	43.80	–	–	–	114	4,466	39.18
Pail and tub-makers	–	–	–	–	–	–	4	158	39.50
Painters	48	1,957	40.77	14	568	40.57	1,023	47,173	46.10
Paper-makers	5	243	48.60	4	266	66.50	186	8,779	47.20
Pianoforte-makers	4	232	58.00	–	–	–	59	2,430	41.19
Plumbers	9	288	32.00	–	–	–	58	2,102	36.24
Potters	4	264	66.00	–	–	–	28	1,642	58.64
Pump and block-makers	7	462	66.00	–	–	–	65	3,727	57.34
Reed-makers	–	–	–	1	20	20.00	9	385	42.78
Rope-makers	14	809	57.78	–	–	–	182	10,448	57.41
Tallow-Chandlers	–	–	–	–	–	–	48	2,601	54.19
Tinsmiths	12	474	39.50	4	195	48.75	241	9,763	40.51
Trunk-makers	1	36	36.00	–	–	–	30	1,175	39.17
Upholsterers	7	329	47.00	2	77	38.50	72	2,821	39.18
Weavers	17	776	45.64	7	403	57.57	261	11,874	45.49
Wheelwrights	10	556	55.60	8	555	69.37	359	19,957	55.56
Wood-turners	2	139	65.50	1	68	68.00	41	2,147	52.37
Mechanics (trade not specified)	49	2,065	42.04	56	2,373	42.37	844	36,833	43.64
IV. INACTIVE MECHANICS IN SHOPS	483	21,025	43.52	146	6,335	43.39	10,855	465,594	42.89
Barbers	4	125	31.25	2	88	44.00	220	9,218	41.90

Basket-makers	2	155	77.50	2	175	87.50	50	3,140	62.98
Book-binders	8	343	42.87	2	79	39.50	89	3,421	38.44
Brush-makers	4	139	34.75	-	-	-	33	1,374	41.64
Carvers	7	292	41.71	-	-	-	46	1,557	31.85
Cigar-makers	6	272	45.33	1	21	21.00	78	2,928	37.54
Clock and Watch-makers	7	280	40.00	2	147	73.50	62	3,593	57.95
Comb-makers	-	-	-	6	345	57.50	94	4,548	48.38
Engravers	6	244	40.66	-	-	-	71	2,938	41.38
Glass-cutters	1	43	43.00	-	-	-	39	1,711	43.87
Harness-makers	9	507	56.33	5	305	61.00	260	12,523	48.17
Jewellers	9	456	50.66	2	55	27.50	275	10,961	39.85
Operatives	36	1,514	42.05	15	503	33.53	908	37,988	38.06
Printers	28	1,190	42.50	4	143	35.75	441	16,824	38.15
Sail-makers	4	269	67.25	-	-	-	139	7,241	52.09
Shoe-cutters	28	1,250	44.64	2	128	64.00	190	7,766	40.87
Shoemakers	270	11,205	41.50	85	3,505	41.23	6,606	285,887	43.12
Silversmiths	6	324	54.00	-	-	-	57	2,590	45.44
Tailors	46	2,294	49.86	10	495	49.50	926	41,293	44.59
Tobacconists	-	-	-	1	39	39.00	29	1,513	52.17
Whip-makers	-	-	-	5	173	34.60	69	2,767	40.10
Wool-sorters	2	123	61.50	2	134	67.00	83	3,804	45.83
V. LABORERS—*No Special Trades*	727	37,274	51.27	269	12,904	48.30	17,764	825,852	46.49
Brakemen	2	72	36.00	5	126	25.20	99	2,740	27.68
Chimney-sweepers	-	-	-	-	-	-	3	118	39.33
Drivers	9	308	34.22	3	116	38.67	167	6,551	39.23
Laborers	694	35,871	51.68	259	12,637	48.79	17,266	806,934	46.74
Servants	22	1,023	46.50	2	115	57.50	212	8,839	41.48
Workmen in powder-mills	-	-	-	-	-	-	17	672	39.53
VI. FACTORS LABORING ABROAD	165	6,771	41.04	40	1,588	39.70	4,978	172,806	34.71
Baggage-masters	-	-	-	-	-	-	21	673	32.05

OCCUPATIONS.—Continued.

OCCUPATIONS.	NINE EASTERN COUNTIES, 1866.			FIVE WESTERN COUNTIES, 1866.			WHOLE STATE, Twenty-three Years and Eight Mos. From May 1, 1848, to Dec. 31, 1866.		
	Number of Persons.	Ages.		Number of Persons.	Ages.		Number of Persons.	Ages.	
		Aggregate.	Average.		Aggregate.	Average.		Aggregate.	Average.
Butchers	13	666	51.23	4	161	40.25	335	16,699	49.85
Drovers	1	39	39.00	-	-	-	13	663	51.00
Engineers and Firemen	24	828	34.50	3	138	46.00	256	9,433	36.85
Expressmen	12	596	49.66	2	87	43.50	117	4,649	39.73
Fencing-masters	-	-	-	-	-	-	3	122	40.66
Ferrymen	2	118	59.00	-	-	-	8	444	55.50
Light-house keepers	-	-	-	-	-	-	8	450	57.37
News Carriers	-	-	-	1	36	36.00	11	444	40.40
Peddlers	7	307	43.85	4	198	49.50	235	10,240	43.60
Sextons	5	283	56.60	-	-	-	38	2,191	57.66
Sheriffs and Constables	9	448	39.77	2	81	40.50	59	3,270	55.42
Soldiers	31	804	25.93	9	231	25.67	2,803	79,022	24.62
Stablers	8	345	43.12	6	256	42.67	209	8,762	41.44
Stevedores	3	161	53.66	-	-	-	50	2,685	53.70
Teamsters	47	2,024	43.06	9	400	44.44	677	26,418	39.02
Watchmen	3	152	50.66	-	-	-	100	4,764	47.64
Weighers and Gaugers	-	-	-	-	-	-	16	975	60.94
Wharfingers	-	-	-	-	-	-	19	893	46 70
VII. EMPLOYED ON THE OCEAN	341	15,856	46.50	2	52	26.00	6,160	279,532	45.38
Fishermen	10	531	53.10	-	-	-	191	7,635	39.95
Marines	-	-	-	-	-	-	3	125	41.66
Naval Officers	5	181	36.20	-	-	-	33	1.582	47.94

Pilots	4	253	63.25	–	–	–	57	3,382	57.58
Seamen	322	14,891	46.21	2	52	26.00	5,876	266,808	47.11
VIII. MERCHANTS, FINANCIERS, AGENTS, &c.	460	22,679	49.30	124	5,853	47.20	9,220	445,410	48.26
Agents	14	648	46.28	3	139	46.33	105	5,026	47.87
Bankers	–	–	–	3	203	67.67	24	1,317	54.46
Bank Officers	3	186	62.00	1	76	76.00	79	4,338	54 91
Boarding-house keepers	4	170	42.50	–	–	–	37	1,703	46.03
Booksellers	1	84	84.00	–	–	–	55	2,777	50 49
Brokers	8	493	61.62	–	–	–	116	5,583	48.13
Clerks	104	3,464	33.30	32	927	28.97	1,755	60,275	34.34
Druggists	10	367	36.70	3	144	48.00	132	5,380	40.76
Gentlemen	53	3,752	70.58	9	526	58.44	977	64,705	66.23
Grocers	13	575	44.23	7	355	50.71	258	12,391	48 03
Inn-keepers	5	265	53.00	3	104	34.67	315	15,598	49.52
Manufacturers	33	1,789	54.21	17	1,036	60.94	826	40,485	49 00
Merchants	121	6,795	56.15	26	1,366	52.54	2,377	125,842	52 95
Railroad Agents and Conductors	12	486	40.50	9	389	43.22	169	6,614	39.14
Saloon and Restaurant Keepers	4	170	42.50	1	38	38.00	138	5,787	41.93
Stove-dealers	–	–	–	1	46	46.00	9	382	42.44
Ticket-masters	–	–	–	–	–	–	12	600	50.00
Traders	75	3,485	46.46	9	504	56.00	1,836	86,607	47.14
IX. PROFESSIONAL MEN	140	7,284	52.03	61	3,298	54.07	3,316	166,953	50.35
Architects	1	44	44.00	–	–	–	6	282	47.00
Artists	11	386	35.09	1	34	34.00	101	4,564	45.19
Civil Engineers	2	102	51.00	–	–	–	65	2,723	41.89
Clergymen	34	2,146	63.11	20	1,242	62.10	609	35,193	57.79
Comedians	2	64	32.00	–	–	–	24	873	36.38
Dentists	2	81	40.50	–	–	–	66	2,642	40.03
Editors	3	90	30.00	–	–	–	41	1,819	44.37
Judges and Justices	–	–	–	3	190	63.33	13	863	66.38
Lawyers	11	555	50.45	6	318	53.00	445	25,023	56.21

OCCUPATIONS.—Concluded.

OCCUPATIONS.	NINE EASTERN COUNTIES, 1866.			FIVE WESTERN COUNTIES, 1866.			WHOLE STATE, Twenty-three Years and Eight Mos. From May 1, 1848, to Dec. 31, 1866.		
	Number of Persons.	Ages.		Number of Persons.	Ages.		Number of Persons.	Ages.	
		Aggregate.	Average.		Aggregate.	Average.		Aggregate.	Average.
Musicians	16	526	32.87	3	139	46.33	165	6,560	39.76
Physicians	23	1,471	63.95	14	792	56.57	820	45,794	55.84
Professors	5	318	63.60	–	–	–	30	1,682	56.07
Public Officers	16	1,008	63.00	7	354	50.57	307	16,646	54.22
Students	5	124	24.80	4	84	21.00	202	4,754	23.53
Surveyors	3	202	67.33	–	–	–	63	3,192	50.66
Teachers	6	167	27.83	3	145	48.33	359	14,343	39.95
X FEMALES	72	2,854	39.65	55	1,881	34.20	4,070	184,431	45.31
Domestics	19	741	39.00	2	43	21.50	361	16,660	61.53
Dressmakers	7	307	43.86	2	91	45.50	147	6,159	50.33
Housekeepers	–	–	–	1	50	50.00	2,309	116,212	46.15
Milliners	4	144	36.00	3	78	26.00	84	3,230	45.81
Nurses	–	–	–	1	58	58.00	57	3,480	45.16
Operatives	1	25	25.00	18	569	31.61	466	13,082	43.84
Seamstresses	12	544	45.33	8	358	44.75	195	8,932	41.90
Shoe-binders	4	143	35.75	–	–	–	37	1,622	38.69
Straw-braiders	1	78	78.00	–	–	–	29	1,122	38.45
Straw-sewers	3	105	35.00	6	130	21.67	26	830	31.92
Tailoresses	9	421	47.78	3	135	45.00	154	6,954	29.99
Teachers	12	346	28.83	11	369	33.55	205	6,148	28.07

Such, then, are the leading statistical tables that we have been able to obtain from the English and American reports. Although a system of registration was inaugurated in Geneva in 1549, and in Sweden in 1751, yet no elaborate, statistical comparison of the relative longevity in the different occupations has been made in any European country except Great Britain.

But from the fact, already noted, that the results of the observations on this subject in England and America agree in the main particulars, and from the fact that the expectation of life is about the same in Sweden, France, England and America, we are warranted, I think, in concluding that, were the same attention given to the comparison of the longevity in the different employments in these countries, we should find that the same general principles hold good in all.

Let us now inquire what general principles in regard to the relative healthfulness of different employments may be deduced from vital statistics.

First of all, we observe the pre-eminent healthfulness of what may be called the intellectual occupations.

According to the table, the average age of all classes of occupations was a little *over fifty years.* The relative longevity of those engaged in the different classes of occupations are in the following order, beginning with the highest:

1.	Cultivators of the earth (managers of estates, farmers)	64.40
2.	*Clergymen, lawyers, physicians, and professors*	56.48
3.	Active mechanics abroad	51.04
4.	*Professional men of all classes* (including musicians, editors, architects, etc.)	50.35
5.	Merchants, financiers, capitalists	48.26
6.	Active mechanics in shops	47.93
7.	Laborers—no special trades	46.49
8.	Employed on the ocean	45.38
9.	Inactive mechanics in shops	42.89
10.	Factors laboring abroad (butchers, pedlers, drovers, teamsters, etc.)	34.71

These statistics are exceedingly suggestive and thoroughly convincing. Observe that of these ten classes—which are here arranged in the order of their longevity—the first five may properly be regarded as brain-workers, while the last five—the lowest on the scale of longevity—includes those who depend chiefly on their muscles. Observe that laborers with no special trades, and consequently with no special responsibility, come four years short of the average longevity; while cultivators of the earth, who own and control farms, exceed it by fourteen years. This distinction between responsible and irresponsible labor is one of vital importance.

Observe also the fact, of such great interest to collegiate students, that clergymen, lawyers, and physicians exceed the average longevity by six years, having a greater expectation of life than any of the ten classes, except cultivators of the earth. Comparing the four professions with each other, I find from all the statistics I can gather from this country and Europe, that the average expectation of life for

Clergymen is................................	60	years.
Lawyers is....................................	57	"
Physicians and Professors is....................	56	"

In view of what has been previously advanced on the relation of the intellect—including, of course, the entire emotional and religious nature—to the brain, we can easily understand why clergymen live longer than any other class, except farmers.

The ministerial calling, when rightly pursued, approximates more nearly than perhaps any other to an ideal occupation. The pastor is called upon to use his whole nature, the emotional and physical as well as the distinctively intellectual. The exercise of the moral faculties is specially conducive to a healthful manhood. No exercise in the world is so healthful as public speaking.

On comparing the different tables it will be seen that they all agree in allowing the greatest expectation of life to those professions and occupations that call for the severest exercise of the mind. This is a vitally important fact, for it strikes at the root of popular and professional impression. It has always been supposed that those who depend on the labor of the mind must expect to sacrifice health to a greater or less degree, as well as the prospects for a green old age; that the immortal part of our nature could be exercised only at the expense of the mortal. But if the facts I have collected are of any value, if general observation is of any value, then the reverse is the truth, and we can but wonder that for so many scientific, progressive years the belief has prevailed, both in the profession and out of it, that activity of the mind is unfavorable to health and longevity.

Even Dr. Thackrah, original and untrammelled as he was, inclined towards the prevailing belief on the deleterious effects of mental toil; but not he, nor Caspar, nor Guy, were furnished with statistics of value, and only gave the inferences of false theories and prejudiced observation. The doctrine that has for years been taught by the profession and believed by the people is, that in the economy of man mind and body are necessarily at war; that they can prosper and grow only as the nations of Europe can extend their dominions—by infringing on the rights of each other. This doctrine is worse than unscientific; it is a libel on the Creator, who has ordained that body and soul should work together, and be developed in grand and beautiful harmony. God makes nothing in vain, and if a mind of wondrous power is given to man, it is designed that it should be used, and it is also provided that it should be strengthened and not weakened by its own activity; and furthermore, that the body should be benefited and not injured by the growth of the soul it incases. The law is this: *mental activity is healthful; mental anxiety is injurious.*

Let us now look at the special occcupations that call for the largest exercise of the intellectual nature.

Clergymen very properly demand our first attention. They are in many respects the most prominent of our professional men. In this country they have always taken the initiative in the cause of education and social progress. Moreover, they have always been cited as illustrations of the destructive effects of mental toil, and in the popular mind the ministry has ever been associated with bronchitis, consumption, insanity, and an early grave. Now while it is true that clergymen, in common with all classes of brain-workers, are peculiarly subject to the class of diseases that result from undue activity of the nervous system and vocal organs, it is also true that they are remarkably free from most of the inflammatory affections that carry away our mechanics and laborers before the average term of life is reached. Let it be remembered that the nervous diseases peculiar to literary men, of which so much is said and written, although they annoy existence and cripple usefulness, are by no means as serious in their character as many acute disorders that over-exertion of the physical powers with attendant exposure seem to invite and foster.

The ministerial calling approximates more nearly than almost any other to the ideal occupation we have supposed. The pastor is called upon to use his whole nature. The exercise of the moral faculties of reverence, hope, spirituality, and benevolence is specially conducive to health and longevity—a fact which appears to have been almost wholly ignored by writers on hygiene.

Again the pastor can, if he will, perform his work in calmness and repose. His life is usually free from the unequal pressures, the agitating storms and crises that at times embitter the existence of speculators and politicians; if he labor in any other than an equable frame, the fault is usually due to himself more than to externals.

Lastly, no one better than the pastor can systematize his time, giving to each day, and each portion of the day, its appropriate work or recreation.

The facts of clerical biography sustain the theories here advanced. Concerning no other occupation are the figures so accordant.

The average longevity of clergymen of all denominations, according to the Registration report of Massachusetts, is 57.79; and 53.80 according to that of Boston alone. In Rhode Island it is 59.25.

Of 417 clergymen whose names are recorded in Allen's Biographical Dictionary, the average age was 65.7; and of these there died:*

13	between	90	and	100	years.
66	"	80	"	90	"
123	"	70	"	80	"
84	"	60	"	70	"
53	"	50	"	60	"
43	"	40	"	50	"
25	"	30	"	40	"
5	"	20	"	30	"

Dr. Lombard, of Geneva, found the average age of 53 Protestant clergymen to be 63.8, excluding those who died under thirty.

Of 888 clergymen who died in Massachusetts, and whose ages were known,

90	averaged	61.77
124	"	65.00
302	"	62.00
372	"	64.00 †

Of 840 clerical graduates of Harvard College, the average age was 63.62; 41 in each 100 reached 70. Of those dying between 1835 and 1841, the average age was 56.‡

Dr. Madden, in a work on the infirmities of genius, while arguing that the professions in which the imagination was largely exercised were relatively unfavorable to longevity, allows clergymen 70 years.

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* Prize Essay of Benj. W. McCready, M.D., Transactions New York State Medical Society.

† Report of Sanitary Commission of Mass., 1850.

‡ Quarterly Register, vol. x., p. 39.

If, then, there be any truth in statistics, as well as any logic in our reasoning, the prospects of a long life for the minister are exceedingly flattering, in spite of the temptations to excessive work of the brain, and of their manifold bronchial and laryngeal disorders. Among no public bodies do we find more aged and venerable men than in the synods of clergymen.

Lawyers.—Of *lawyers* it has been said, that they need a "bad heart and a good digestion." If this be true, then our pleaders and counsellors are certainly supplied with these conditions, for they stand very high on the tables of longevity. The law is indeed very far from being a natural or ideal profession. The advocate must spend hours and days in the horrible air of court-rooms; the counsellor leads the most sedentary of all lives in his office chair.

On the other hand, law presents a field for the exercise of the largest powers of reason and judgment; as a science, it is pre-eminently intellectual in its character, and is intimately interwoven with statesmanship and diplomacy.

Public pleaders speak long and earnestly, sometimes for days together, but they rarely complain of the clergymen's sore throat or of anything analogous, for the simple reasons that their tones are more conversational; their briefs are merely used for reference; and, far more than clergymen, they harden the neck to the variations of the atmosphere by a wise and judicious neglect.

The average age of lawyers in Massachusetts is 56.21; in the city of Boston 60.20. It is clear that they do not stand as high as ministers in statistics any more than in theory. Judges live to be 66.38.

Physicians.—Medicine is, in some particulars, the most inconsistent and unequal of the professions. In one aspect it is peculiarly conducive to health, in another is theoretically most hazardous. It calls into action the best faculties of both mind and heart; its study embraces, in its totality, the whole range of human thought and feeling.

Moreover, the physician is not alone an operator in bodily injuries, and a prescriber for merely physical diseases; it is his solemn, responsible privilege to

> "Minister to a mind diseased;
> Pluck out from the memory a rooted sorrow;
> Raze out the written troubles of the brain."

—a task that demands his own moral as well as intellectual sympathy and inspiration. In so far, then, as medicine gives scope for the exertion of man's best faculties of mind, in so far as it quickens and intensifies the moral nature, in just so far does it approximate to the ideal type of a profession. But there is another side to the picture.

The physician, especially the country practitioner, cannot adjust his hours of labor according to hygienic principles. The life of a faithful, successful practitioner must, then, be one of exposure, anxiety, and irregular toil. The city physician is often able to combine in a most happy manner the physical exercise of daily practice with various study and acquisition; thus marrying, as it were, bodily exercise with a purpose, to the calm pursuit of science—a most fortunate union, that cannot fail to be conducive to vigorous health and length of years.

It is stated on very good authority, that physicians are more than ordinarily subject to cardiac disease, owing to the fact that they are so continually obliged to disguise their feelings and thoughts while in the presence of patients. Whatever of truth there may or may not be in the statement, it does not prevent their attaining a high average longevity.

Of 490 physicians of Massachusetts who died before 1840, the average age was 57, and 35 in each 100 attained to 70 years.[*]

In Thacher's Medical Biography (quoted by Dr. McCready) 145 physicians are mentioned, whose average age is 62.8. Of these:

3	died	between	90	and	100	years.
25	"	"	80	"	90	"
37	"	"	70	"	80	"
30	"	"	60	"	70	"
21	"	"	50	"	60	"
18	"	"	40	"	50	"
15	"	"	30	"	40	"
12	"	"	20	"	30	"

It thus appears that 59 of these lived to be over 70, and 100, or more than two-thirds, over fifty.

Of 32 physicians and surgeons whose lives are sketched in Gross' Medical Biography (including several who died before their prime), the average age was 59.

The *farmers* of intelligent districts are properly included in the class of brain-workers. A gulf as wide as the Atlantic separates the husbandman, ruling "*sua arva paterna*," and the common laborer on the farm, hired at so much a week. A stupid or shallow-brained man, devoid of energy or foresight, can no more make a successful farmer than he can make a successful lawyer, merchant, pastor, or physician.

It is a fact generally known that the average longevity among farmers in this country is greater than that in any other occupation. But their green old age is not due to their muscular exercise alone, for mechanics and laborers, who work even harder than the majority of farmers, do not live as long by many years; it is not due to the pure air they breathe, for many outdoor workers are much lower in the scale of longevity than they; nor, lastly, is it due to the calmness of rural life, for the farmer is burdened with grave responsibilities and oppressed often by weightier cares than the workman he hires by the day or month, the butcher in the market, or the teamster on the highway, all of whom die much younger than he.

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[*] Report of Sanitary Commission of Massachusetts, 1850.

Farmers are long-lived not only because of pure air, moderate exercise, and country quiet, but more especially because they can counteract the animalizing effects of merely physical labor by varied activity of the mind.

In Massachusetts the average age of 22,764 cultivators of the earth was 64.40.

Merchants, manufacturers, and men of business next demand our attention. That the head of any business firm must be a man of intellectual activity and resource, there can be no room for question. Mercantile life, with its myriad complications and crises, makes heavy drafts on the wits and genius of the ablest. And yet the pursuits of commerce, manufactures, and trade do not usually develop the best faculties of man in their entirety; they may be successfully prosecuted without the aid of the moral nature, or the highest capabilities of the mind. The frequent but by no means necessary tendency of commercial life is to sordidness, externalities, and morbid worship of property as the end rather than the means of existence. So far, then, as business life of any kind begets narrowness and greed of gain, just so far is it unfavorable to health. The merchant who is master of his affairs can be measurably systematic in his labor. Moreover, the pursuits of trade will always be congenial to human nature, until the worship of Mammon is less universal than now; and the man of business cannot fail to be inspired by the hope of the bright rewards of his occupation, though at times he may be sickened with its cares and uncertainties. But he is the victim first prostrated by the financial storms which at irregular periods sweep over the land, paralyzing, for the time, the mighty arm of trade. We find business disasters are very frequently the exciting causes of insanity.

But in spite of all drawbacks attendant on business life, merchants are usually healthy, and their average longevity, though below the standard of clergymen, lawyers, or physicians, is greater than that of artisans and laborers.

In the table of Dr. Jarvis, their average age is 48.39; in the report of Massachusetts, covering twenty-three and more years, it is 47.95; in Rhode Island it is 54.33, while manufacturers are put down at 47.80; in Boston, 58.81. The average of all (merchants, financiers, and capitalists) is 48.26.

Other causes besides brain labor have made moderns more healthy than the ancients. Sanitary laws are now better understood and obeyed. Says Dr. Jarvis in a recent essay, speaking of Europe a few centuries ago:

"Even in the midst of this wide waste of death, the people took no pains to search out the causes of these pestilences; they only thought of contagion, and of endeavoring to prevent the spread of the disease from the persons and houses afflicted to those that were yet free from it. And though there were abundant sources of pestilence in their midst; though there were stagnant moats and pools; though there was no underground drainage, but superficial gutters filled with all sorts of filth, decaying animal and vegetable matters, and so choked that the water could not run off; though their houses were unswept and their inhabitants wore their clothing unwashed; though the air within and without was reeking with pestilential exhalations—yet the people and the rulers took no note of these things."

Artists and Musicians, as a class, only cultivate the peculiar gifts they enjoy, ignoring oftentimes the higher intellectual and moral endowments. Whatever in art or music is ennobling, enlarging to mind and soul, serving to make man more intellectual, more spiritual, and more catholic in feeling, must be conducive to health and longevity; but the great body of musicians in this country, at least, are simply men of special aptitudes, and are oftentimes very irregular and dissipated in their lives. The average age of 101 artists in Massachusetts was 45.19. As a class they are unbalanced men, for the reasons just stated, and, if the statistics of insane asylums are worthy of credence, artists furnish a greater percentage of inmates in proportion to the numbers in the profession than almost any other class.

Students in academies and colleges are as healthy and vigorous as any other body of young men of similar ages in the country.

In spite of the late hours, and oftentimes irregular habits of students; in spite of their excessive use of tobacco, and spasmodic industry, they are, as a rule, both in this country and in Europe, eminently vigorous and healthful. Neither among clerks, mechanics, nor laborers have I seen so pleasant an average of sturdy, wiry, bounding health as among the undergraduates of Harvard and Yale.

Students are popularly supposed to shorten their lives by application to books. Whenever a student dies during his educational course, the fact is noised abroad as another evidence of the pernicious effects of labor of the brain. There is no question that some students do occasionally injure themselves by excessive or disproportionate toil, and there have been possibly a few deaths from this cause; but such instances are very rare. It cannot be too often repeated that study is healthful, and conduces to longevity. Students sometimes injure themselves by excessive and useless anxiety about their standing in their classes, or distress themselves in their zeal to secure high prizes in scholarship. In such cases it is not so much the labor as the anxiety which kills.

Teachers of primary schools are not usually over-healthful nor very long-lived, but the occupation of teaching itself is not necessarily injurious. Of 74 professors mentioned in Allen's Biographical Dictionary, the average age was 61; of 22 in Massachusetts, 55.81; while of 359 teachers in the same State, the average age is but 39.95.

Why is this discrepancy? The answer is obvious. Teachers stand low on the list, partly because very few follow teaching as a life calling, but abandon it usually before arriving at maturity; and therefore of those who die and are registered as teachers, the average age can, of course, be no guide in determining the healthfulness of the occupation; partly because the duties of instruction in the elementary branches do not call forth the highest powers of intellect, like pleading and sermon-writing; and partly because they are confined for many hours each day in poisonous and over-heated rooms, subject all the while to multitudinous petty vexations and "insect cares," which, though they are mighty enough to torture the body and fret the spirit, are too insignificant to develop the highest type of character.

Authors, as a distinct registered class, are not numerous either in this country or in Europe, but they are scattered through all the professions. Whatever hygienic laws apply to professional men must also apply to authors, as such. It follows, therefore, from what has been said that authorship is favorable, and eminently so, to health and long life.

On the score of congeniality, we may safely assert that no class so love their calling as do authors. Says one: "Of all artists, the poet is most fond of his work;" and the statement may be extended to embrace all classes of writers.

Unless driven by pecuniary straits, authors can regulate their hours of labor according to hygienic laws. They can systematize their time; they can think in repose. But authors are usually men of genius endowed with exalted imaginations, and subject to varying moods and fitful humors. The muse is often coquettish, and will not come and go by clock-work; fancy will not soar by the laws of arithmetic. It is one of the compensations of genius, that he who possesses it largely must be its slave. The imagination of great souls breaks from the fetters of hygiene, and they cannot restrain it if they will.

It is useless for such geniuses to attempt to regulate their seasons of creating by the chronometer, like the compiler or statistician.

So much has been said of Kirke White, Chatterton, Keats, and others who were similarly unfortunate, and so many homilies have been written on the lessons of their lives, that those who have not investigated the subject will be surprised at the statement that the average age of the poets, essayists, historians, and novelists of England, whose names have been handed down with various degrees of fame, is nearly *sixty years.* If we go back to classic times, we find that Cicero died at sixty-four; Demosthenes at sixty; Socrates at ninety; Virgil at fifty-one; Tacitus at sixty; Plato at eighty; Aristotle at sixty-three; Æschylus at sixty-nine; Ovid at sixty; Livy at seventy-six; Anaxagoras at eighty-eight; Zeno at ninety-nine, and Xenophon at ninety; and if the list be extended to include all the immortal authors of antiquity, the average longevity is still found to be very high. Comparing the different spheres of intellectual activity, we find that philosophers and men of science live longer than poets, or those who are endowed with rich gifts of fancy. Observe the following comparative list:

Philosophers and Men of Science.		*Poets and Romancers.*	
Galileo	78	Virgil	52
Franklin	84	Dante	56
Herschel	84	Petrarch	70
Newton	85	Fenelon	63
Halley	86	Pope	56
Locke	73	Molière	53
Roger Bacon	78	Horace	57
Buffon	81	Racine	59
Harvey	81	Milton	66
Galen	79	Young	80
Jenner	75	Corneille	78
Haller	70	Voltaire	85
Galvani	61	Wieland	80
Francis Bacon	78		

The causes of this difference are sufficiently obvious. The life of the philosopher is one of calmness, regularity, and unworried activity of mind; the life of the poet is often one of excitement and irregular and spasmodic industry, or of absolute dissipation; the average longevity of the one class is probably between 70 and 80 years.

That even these irregularities and excesses are not of themselves so destructive as is supposed, is proven by the records of literature. With the sad examples of Kirke White, Schiller, Chatterton, Byron, and Poe before our minds, we find that the average age of authors is very high. The average age of the writers of France, Germany, and America, of the past century, will not fall much below that of clergymen. *Journalists* in this country are not as healthy or as long-lived, on the average, as authors, and for very obvious reasons. Those, however, who work regularly and calmly, and obtain a proper amount of sleep, may and do live as long as other classes of literary men.

We seem, then, to be shut up to the conclusion that intellectual activity is not only healthful, but pre-eminently so, and that the effects of the mental excesses of professional men are far more than counteracted by the conserving tendencies of the exercise of the higher faculties.

A corroborative argument in favor of this position is to be found in the fact that *the expectation of human life increases with the progress of civilization.* Although this has been denied by some, there can be little room for doubt to the candid inquirer.

Registrations of births and deaths were kept by the Greeks and Romans.

Dr. Jarvis (quoting Mallet) thus speaks of the improved expectation of life in Geneva:

"The expectation of life in that city was:

"In the 16th century	21.21	years.
" 17th "	25.67	"
" 18th "	33.62	"
1801 to 1833	39.69	"
1814 to 1833	40.68	"

That is, the whole sum of life granted to a thousand persons, from birth to death, at whatever age, was twenty-one thousand two hundred and two years in the sixteenth century, and forty thousand six hundred and eighty years in the nineteenth century; giving in the former an average of twenty-one years and one-fifth, and in the latter an average of forty years and two-thirds, and showing an increase of human life of nearly one hundred per cent. in those three hundred years. This improvement is due to science and the mental and moral activity to which this progress is due. The rate of annual mortality in France in 1781, was one in 29; in 1802, one in 30; and in 1823, one in 40. In London in 1700 the annual mortality was one in 25; in 1781, one in 40.

If, then, there has been a gradual and continual increase in the expectation of life on both sides of the Atlantic, the inference is warranted that such increase is owing very materially to the expanding intellectuality of our modern civilization, as well as to a better knowledge and observance of the laws of health.

The second fact that we learn from the study of vital statistics is this: that *the greater the mental and moral endowments of a man, the greater the amount of intellectual labor he can undergo, and the better his prospects for longevity.* It would seem that those upon whom nature has been most prodigal of her intellectual gifts can work harder and longer, with better expectation of life (other things being equal), than the rank and file of humanity in any of the professions. Although this idea has not been advanced before, so far as I am aware, its truth is, I think, satisfactorily established by analogy and by literary and scientific biography.

Isolated illustrations of longevity among great men are familiar to us all. But we have no right to generalize from a few instances. In order to establish the general principle that the greatest geniuses and hardest brain-workers of the world attain an exceedingly high longevity, we need as many cases as can well be obtained.

I have therefore taken the pains to go through the Cyclopædia, and to note down the ages of *one hundred* of the greatest men of history—those who have created epochs, and have been the leaders of the world's thought in literature, art, science, and statesmanship—and I have found that the average age of these was much higher than that of literary and professional men generally; nay, even much higher than that of clergymen, the longest livers of all. This list, which covers a period of many centuries, contains such names as Goethe, Coleridge, Lessing, Beranger, Wordsworth, Voltaire, Hume, Milton, Shakspeare, Dante, and Irving, among men of letters; Raphael, Michael Angelo, and Reynolds, among painters; Malebranche, Locke, Leibnitz, Hobbes, and Hamilton, among modern philosophers; Socrates, Aristotle, Plato, and Cicero, among the ancients; Harvey, Cuvier, Buffon, Galileo, Humboldt, Newton, Jenner, and Faraday, among men of science; Napoleon, Marlborough, Washington, Metternich, Richelieu, Burke, Webster, Calhoun, and Clay, among warriors and statesmen; and Calvin, Luther, Knox, Butler, Paley, and Edwards, among theologians. No one will deny that these, and similar names, fairly represent the giants of history.

Now, the aggregate ages of the one hundred men on this list was not far from 7,500, giving the astonishing average of nearly *seventy-five years*, which is twelve to fifteen years higher than that of the most favored of ordinary professional men.

Whoever will make the effort to fill out any list of names that thoroughly represent the leaders of the world's thought and activity will, I am sure, arrive at results not essentially different from mine.

In opposition to the facts here presented, it will be said that nervous diseases are on the increase among us, and that they are most frequent and most severe among brain-workers. That this impression is well founded there can be no question. Paralysis, neuralgia, hysteria, dyspepsia, hypochondriasis, and insanity are certainly more frequent, both in this country and in Europe, than they were thirty or fifty years ago. In my own practice, I am continually amazed by the variety and subtlety of phase that these diseases assume even in the young and growing generation. But it is one of the compensations of these nervous disorders that they are not rapidly fatal, and that they *protect* the system against febrile and inflammatory affections that hurry the Indian, the negro, and the poor laborers of our own race into early graves.

The third fact which we learn from these statistics is, that of those occupations which are not distinctively intellectual, those are most favorable to health and longevity which, on the whole, demand the greatest relative activity of the mind.

Those mechanics who, like carpenters, carriage-makers, blacksmiths, use their brains as well as their muscles, although they work much indoors, are healthier and longer-lived than shoemakers, tailors, jewellers, and operatives in factories, whose labor is so rigidly systematized that they are obliged to do very little more thinking than the machines on which they are employed.

It should be remembered, also, that a *variety* of muscular activity is more conducive to health than mere routine, that calls into play but a single set of muscles.

Active mechanics abroad live to be 51.04.

Brickmakers live to be 48.63. This is a very good average. Their occupation admits of a variety of toil, and much of the time they have the benefit of the sunlight.

Carpenters attain the age of 51.20. Their trade admits of a variety of toil. Some of the time they are outdoors, and then again they labor in shops. Most of the time they are exposed to the sunlight. All of the principal muscles are called into exercise at various times and in various combinations.

The carpenter, breathing no noxious gases and no poisonous dust, cramped in no narrow position and imprisoned in no heated rooms, is, on the whole, the healthiest of artisans.

There are to be found those among carpenters who are obliged at times to labor in unhealthy localities. There are some who work entirely in shops, breathing heated and impure air; but as a general rule, most of those who follow this calling are enabled, for a portion of the year at least, to labor in the open air. They are rarely, if ever, injured by dust. Their labor admits of great variety, and in some of its departments demands varied activity of mind. The master carpenter is really a brain-worker.

Calkers and ship-carpenters are also comparatively vigorous, and live a comfortable length of years. Calkers are obliged to labor in a confined position, and the mere exercise of their trade is not stimulating to the mind, nor calculated to develop the whole physical man. That their average longevity is good is due to the pure air they breathe, more than to any other cause.

Ship-carpenters and calkers spend all or nearly all of their time in the open air. Although boats and vessels are sometimes built under cover, still the protection afforded is not usually sufficient to keep out entirely pure air. I have had occasion at different times in my life to see many ship-carpenters. I have usually found them to be a healthy and vigorous class of men. The odor of tar is by some supposed to be beneficial to those affected with disorders of the lungs. If there be any truth in this popular belief, the ship-carpenters and calkers should certainly have the full benefit of it. There is no question that inhalations and injections of tar are beneficial in inflammations of the mucous membrane of the throat.

Coopers, carriage and clock makers, and wheelwrights are all quite healthful and have a good expectation of life, and for the same reasons that apply to the carpenters and joiners. The journeyman may become an architect, provided he be able and willing to climb the rounds of the ladder, one by one. It is impossible to estimate the benefit that results from proper encouragement to ambition. Thousands of the European peasantry are kept down in body and in mind by the force of uncontrollable circumstances. They are chronically poor. They have little chance to rise. They have consequently no stimulus to ambition—no motive to sustained, aspiring industry. In the United States, on the contrary, all mechanics have a chance to rise, provided they have the ability and the energy. The humblest and the poorest may become rich, intelligent, and influential. These considerations act as a stimulus to those mechanics who are not dead to all ambition, and impel to active thought and strong exertion. In those callings where the chances of promotion are distant and cloudy, we shall see that men become desperate and animalized, while in the same proportion their life-expectation diminishes.

Grocers are said to be troubled with a kind of itch, caused by the irritation of sugar and other substances they handle. But although this affection is disagreeable, it is neither dangerous nor fatal. Their life is active, and allows of a wide range of intelligence and energy; while sluggish dotards may exist by the occupation, it yet affords scope for the highest business abilities. They die at 48.03 years.

Grocers have usually a wide variety of duties. They are not only to "tend store," wait on customers, consummate bargains, but also in many cases to ride much in the open air, to deliver goods at the houses of their customers. When their business grows to large proportions they become business men, and are to be classed as merchants. I need not say that by grocers is here meant those engaged in retail trade, and not wholesale dealers, who, of course, are always to be classed as merchants. Sometimes grocers are compelled to rise very early in the morning, in order to obtain their produce and bring it to market. On this account they sometimes are obliged to cut short their hours of sleep. I need not remind those who have read my essay on sleep, that I regard the common idea that we take too much sleep as erroneous. Among our brain-workers more take too little sleep than too much.

Blacksmiths live long, and are not subject to any peculiar disease. Of more than 1,000 in Massachusetts, the average age was 52.69. While their work is hard, it admits of not a little variety. They breathe good air and observe regular hours of labor. The cinders, smoke, and heat are injurious to the eyes, and give rise to chronic inflammations, but have no marked effect on the general health.

Millers do not seem to be injured by the dust of flour and meal they continually breathe, although Thackrah distinctly asserts that starch and farina manufacturers are more than ordinarily subject to bronchial and pulmonary disorders. Their occupation is in all other respects healthful and elevating, and they may not improperly be classed as manufacturers. The average age of 186 in Massachusetts was 58.58.

We now come to speak of those employments that are not regarded as favorable to health and longevity, which we find to be by far the largest class, including most of the trades and mechanic arts that attend upon and are a part of our modern civilization.

Butchers are proverbially fleshy, bloated, and red-faced. So universally is this the case, that to "look like a butcher" is the everyday phrase applied to any one whose countenance indicates more of the animal than of the spiritual nature. To this rule, as to all rules, there are marked exceptions. I have seen butchers in carts and in markets, with their shrunken faces, who seem to gain no flesh or color, even after dealing in meat for years; yet those few are almost always healthful and strong.

The inquiries at once arise, What is the cause of this professional redness? Does it indicate unusual vitality?

Although our knowledge of vital chemistry is too imperfect to enable us to make a scientific demonstration of the theory, it is yet very clear, I think, that the butcher's face is due to the emanations of the stalls and slaughter-houses. We seem, indeed, to be driven to this explanation by exclusion. If exposure, if vigorous exercise, if intemperance, or all conjointly, can account for this color, then the sailors, laborers, and teamsters, who are even more exposed and active, and, as a rule, even more intemperate, ought to exhibit this peculiarity to a far greater degree.

I pronounce this opinion with caution, for I am aware that it is one of the most difficult things in the world to arrive at absolute truth in all matters of this nature. Our life is so complex, so many and diverse influences are ever and continually surrounding us, that it is almost impossible to tell in any given case just what cause has produced any definite result on the human constitution. As a rule, those who know the least are the most ready to give positive opinions. Thousands of years ago Confucius said: "What you know, to know that you know it, and what you do not know, to allow that you do not know it—that is knowledge." This maxim should be remembered by all. Our libraries are filled with erroneous statements on the various matters connected with health, that would never have been made if the authors had been willing to confess their ignorance.

To the next inquiry, whether the color and fat of the slaughter-house are healthful, very opposite responses are given from Massachusetts and from beyond the sea. Of 335 butchers in Massachusetts, the average age was 49.85; while in England they are next to the last of the twelve classes in order of healthfulness. Dr. Farr, in the report already quoted, states that the mortality among butchers was fearful; that the proportional percentage of deaths among them was greater than that among the miners, and only exceeded by that of inn-keepers and beer-shop tenders.

It seems hard to explain this discrepancy. Dr. Thackrah thought that the emanations of stalls and stables were peculiarly healthful, if not medicinal in their character, and on that theory accounted for the vigor of butchers, groomsmen, and stable-keepers.

That these odors and emanations of dead and living animal matter are not *very deleterious* to health is proven by the strong frames and fair longevity of those who all their lives are subject to them.

Tanners and curriers are the most singular paradoxes among artisans. They breathe an atmosphere intensely offensive, even to nerves that are not sensitive; they labor in dampness and amid decaying animal substance, and yet their lives are not short, nor are they subject to any special form of disease. A stranger visiting a tan-yard for the first time is sickened and well-nigh suffocated by the horrible stench, while he sees burly gray-haired men handling and cleaning the hides, to all appearance drinking in health at every breath. Years ago it was observed in Europe that the vile odors of tan-yards were not injurious to the health of those employed in them, and very naturally the theory arose that they were, in fact, medicinal in their character, and particularly adapted for consumptives.

In the course of my life I have visited many tan-yards. I have seen, I think, the worst of them. In Eastern Massachusetts, where tanning is quite extensively carried on, I had opportunity, a few years ago, to visit a large number of yards. At first the odor was frightfully disagreeable. The wonder was that any human being could live in such places. The currying shops are particularly disagreeable. And yet I could not find that those who labored in those establishments were more afflicted with disease than other men. Neither am I able to say whether they were or were not exempt from disorders of the lungs. Popular impressions on these subjects are very apt to be erroneous. The question can only be settled by comparative statistics. Some philosopher has said, " Any one can state an opinion, but very few can collect and arrange important facts."

In the " Annales d'Hygiène" for 1862 is an essay by Dr. M. C. Beaugrand, from which I glean a brief history of the variations in medical sentiment on this important subject.

Ramazzini, in his "Advice to Artisans," published in 1797, distinctly asserts that tanners are very unhealthy; Civillo, of Naples, gave a contrary opinion in 1799. Ackermann, of Germany, in a work published in 1780, also was of the opinion that tanners and curriers were as strong and vigorous as any class of laborers. Patissier, of France, favored the views of Civillo and Ackermann, declaring with great positiveness, " la profession de tanneur plus désagréable que dangereuse."

Halfort, of Germany, and Dr. Thackrah, of England, agree in attributing to the atmosphere of tan-yards conservative if not medicinal virtues. It was at one time asserted that patients far gone in phthisis had been restored by laboring over skins and hides, breathing the disagreeable air of the yards, but from observations that have since been made it seems to be fully established that phthisis is as common among tanners as among laborers in any healthy occupation.

Of 160 cases of sickness in the hospital of Würtzbourg, cited by Schlegel, there were very many cases of tuberculosis. Statistics clearly show that pneumonia is both common and fatal among them, while they are far from being exempt from bronchitis and kindred affections.

Their average age in this country is about 46, which is certainly not very high, even for laborers whose occupation demands little exercise of the nobler faculties. The conclusion we must accept, then, is this, that the occupation of tanning and currying, as compared with other employments of a similar grade, has neither a positively deleterious nor salutary effect on health and longevity, but that it is, indeed, rather *negative* in its influence on those who become habituated to its disagreeable and stifling odors.

Teamsters, stablers, and drivers do not live to be much over 40. It is the common belief that the odors of barn-yards and stables are healthful, and there are those who, with failing health, seek relief by hiring themselves out as groomsmen. It cannot be denied that some are thereby benefited, just as some have been cured of consumption by the air of tanneries; but in both cases it is more than probable that the same kindly results would have followed the change to any active occupation.

Tallow-chandlers seem to belie the aspersion cast on their trade, by living longer than almost any other class of artisans, for of 48 in Massachusetts, the average longevity was 54.19. But inasmuch as many of these were not unlikely heads of, or partners in firms, with the responsibilities and cares of manufacturers, it is evident that more abundant statistics are necessary before we rush to the conclusion that soap and tallow establishments of modern times seem to prolong the lives of those employed in them.

Glass-blowers have a most unfortunate calling, which, although it demands a kind of skill and practice, is always seriously detrimental to the system. They are exposed to an unnatural temperature, and are continually obliged to overwork the lungs. Pulmonary troubles are common among them, and, according to the statistics in Massachusetts, they die at 38.77.

While I was acting as surgeon in the navy in the Gulf of Mexico, I had excellent opportunity, for eighteen months, to study the effects of the high temperature of the engine-room on the health. The coal-heavers and firemen were exposed to a disagreeably high temperature when they were on duty, even though the steamer was not under way. I am sure that there were more cases of disease among the firemen and coal-heavers than among the seamen. They were more frequently attacked by rheumatism and kindred affections, and also sooner become debilitated and unfit for duty. Still it must be admitted, as before remarked, that the human system can bear, without apparent injury, long-continued exposure to heat.

Founders and furnace-men are subject to rheumatic disorders, and die before they are 45. Thackrah maintains that the sudden transitions from heat to cold to which these classes are liable have no noticeable influence on the health. His statement needs to be considerably modified. While it is true that habit to a degree reconciles the system to such changes and irregularities, as, indeed, to almost all others, it is also true that those who are much exposed to excessive heat, with sudden transitions to cold and wet, are more than ordinarily afflicted with the pains and inflammations of rheumatism. More than that, the experience of many surgeons establishes beyond a doubt the fact that the coal-heavers and firemen on ship-board send a much larger relative percentage to the sick-bay than do the seamen and landsmen.

But so far as temperature is concerned, it must be confessed that the human system has a wonderful power of adapting itself to a very wide range, without perceptible injury to health. Man is so constituted that he can bear extreme heat or extreme cold, within certain limits, and keep in health and attain a good longevity. It is also difficult to say just how much exercise the lungs will bear without injury. A large amount of exercise is unquestionably beneficial to the lungs when they are very weak indeed, but this exercise should admit of greater variety than that required in the occupation of glass-blowing. It would be very interesting to investigate the effect of blowing on wind instruments on the health, in order to ascertain the limits to which such exercise can be carried without injury. If we are to judge by the appearance of those who perform in our orchestras, we should say that they were healthy; but plethora is not always strength. We are frequently deceived by appearance in hygiene as in morals. Many who are very thin and pale-featured live to be old.

Those who work in an atmosphere the temperature of which is considerably higher than that of the system, are, in fact, much of the time in a kind of fever that must consume the vital force.

Their labor being neither elevating nor energizing to the mind, affords no stimulus to the higher nature, by which the injurious features of their occupation may be counteracted.

Stone-cutters and knife-grinders suffer from a kind of bronchitis peculiar to themselves, caused by the irritation of the fine particles continually inhaled. It has been estimated that in one of the Sheffield manufactories 75 pounds of dust are given off every day; that a single packet of needles loses 5 pounds on the grindstone.

Dr. Hall, of the Sheffield Hospital, says that the expectation of life for a grinder at 21 is but 14 years.

Stone-cutters are more out of doors, and have a little greater variety of exercise, but in the nature of things they cannot be healthy or long-lived. In Massachusetts they live to be about 46 years old.

Stone-cutting is to be classed among the unfortunate occupations. It is one of the evil compensations of civilization, that it introduces, and calls forth, and makes necessary many callings that cannot be followed except at the expense of life and health. Making lace, as it is carried on in Brussels, is to be classed among the unfortunate occupations. Those who depend on it for a livelihood are exceedingly pale and sickly. The condition of many of the poor in Europe is frightful indeed. I have seen the peasantry by scores and hundreds wandering about the streets of London and Liverpool, vainly looking for something to do. Persons so distressed are glad to take any offer, even though they well know that they must shorten their lives. The question with them is not one of health, but of existence.

Shoemakers, tailors, jewellers, engravers, labor many hours in cramped positions, breathing most unwholesome air, with but little active exercise of any kind.

The shoemakers in Eastern Massachusetts usually take no pains to ventilate their shops, but work blindly on, 12 or 15 hours a day, around hot stoves, and in crowded rooms. The result is seen in their wan, sallow features, hollow chests, and sunken eyes. Inflammatory diseases do not attack them as readily as they do butchers, teamsters, and outdoor laborers, for the reason that their blood is usually thin and watery, and they have little superfluous adipose tissue which a fever can feed on and consume. The same is true of all who are employed in unhealthy, sedentary occupations indoors.

In the large shoe manufactories, where the rooms are more spacious, and arrangements are made for working in a standing posture, and where machines are used in some of the merely mechanical operations, the general appearance and standard of health of the employés is much more favorable than in the old-fashioned, yet still existing cobbling shops.

I have seen thousands of shoemakers, and have had abundant opportunity to study the effects of the occupation on the health. There is no question that, as a class, shoemakers are not very robust or long-lived. And yet we sometimes see cases of great longevity among them. So far as I have observed, they are more careless in regard to ventilation than is necessary. They seem to delight in impure and overheated air. Any one who will take the pains to visit the shops that abound in the towns of Eastern Massachusetts, will be convinced that the shoemakers there are culpably reckless in this particular. Undoubtedly habit has much to do with their apparent indifference on this subject. They become so used to overheated rooms that they actually suffer if the temperature is not above a point that would be agreeable to others. The consequence is that they become very liable to take cold.

Of over 6,000 shoemakers in Massachusetts the average age was 43.12; of 20 in Boston alone, 34.35; of 12 in Rhode Island, 53.91. The Registrar-General of England places them second on the list in order of longevity—most surely a wide discrepancy, and one that we cannot explain, if the shoe business in England is carried on in the same way as in Massachusetts.

Certainly the average of more than 5,000 cases is sufficient to establish the general law in that State, at least, which is the headquarters of the boot and shoe manufacturing interest of the country.

Tailors, jewellers, engravers, and machinists die before they are forty.

Machinists are injured by the filings of iron and steel, by the *confined air* of their shops. They have opportunity for the exercise of the inventive faculties. Their trade is directly associated with engineering and with all forms of machinery, yet the vast majority are mere routinists, perfectly content with the wages of manual labor. They seem to be as low on the tables of longevity as the tailors or jewellers.

They are also injured by the iron filings which they breathe. They die at *forty.*

Printers are short-lived. They work hard and long, at unseasonable hours, in low, over-heated, wretchedly ventilated apartments, with little opportunity for exercise either of mind or body. Although brought into constant communion with the best thoughts of the world, they are but little more elevated and stimulated by them than are the type and presses. They are usually reckless and intemperate. That the occupations of type-setting and printing are not necessarily injurious is proved by the fact that in every large establishment there are a few individuals who attain a good old age.

The average age of 441 in Massachusetts was 38.15. Working over bad manuscript, oftentimes by artificial light, makes diseases of the eye very frequent among them.

On the influence of modern improvements on longevity, Dr. Jarvis says:

"Most, if not nearly all, of the improvements in the means and facilities of business labor and the arts, or in domestic and social life in their several ways and degrees, have presently or remotely this effect of increasing the vital power of man.

"The exhibitions of inventions, whose name is legion, in the patent offices and elsewhere—models and descriptions of things new and of things improved—are indications of progress in civilization, of increase in means of sustenance and human comfort, and consequently in human power and longevity.

"Ploughs, mowing-machines, horse-rakes, apple-parers, steel forks, all the kindred adjuncts of agriculture, increase the productions of the earth, while they lessen the labors of the cultivator or make them more effective. By aid of these, grain, hay, roots, fruits, cattle, sheep, &c., are produced more easily and abundantly, of better and more nutritious quality, and at less cost. The whole people, and especially the poor, are better nourished and strengthened, better armed to meet the responsibilities and to bear the dangers of life."

Bakers, cooks, and confectioners are said to be peculiarly liable to apoplexy, which is due to the fact that their heads are often exposed to sudden gushes of hot air, while in a stooping posture. By the Registrar-General of England, bakers are placed tenth in the order of longevity—only two classes, butchers and shop-tenders, being below them. It has been supposed that the dust of flour may operate injuriously, but if so why are millers so healthy and long-lived?

Miners and colliers, although living under ground and forced to breathe air not unfrequently poisonous, though liable to fatal accidents and explosions, seem to have a better expectation of life in England than either bakers, butchers, or beer-shop keepers.

While I was in Europe, in 1869, a terrible accident happened to a mine in Germany, with fearful loss of life. When I returned home a few weeks afterwards, I found that a terribly fatal accident had also befallen the miners of Pennsylvania. That these accidents should occur in these days, when every miner can have the safety-lamp, seems inexcusable. The safety-lamp of Sir Humphrey Davy was one of the most beneficent discoveries of modern times. Fortunately, these great accidents occur but seldom. That they must be comparatively rare is evidenced from the fact that the average longevity of miners is quite fair. Thus we find that the human system can, within certain limits, become accustomed to darkness as well as to an unnaturally high temperature.

Painters and plumbers are liable to lead-colic, with its terrible train of woes. Beginners in the painter's trade almost invariably complain of headache and general *malaise*, and some are obliged to abandon the occupation. Even the smell of turpentine has on some a powerful stimulating effect on the kidneys, that cannot fail to be of injury. The average age of over 1,000 was about 46 years.

The unhealthiness of some of our modern occupations is partially made up by the superior rewards of labor. According to Dr. Jarvis, "labor is better rewarded now than in former years. Not only are larger wages paid in money, but the money received procures for the worker better means of sustenance, better protection of clothing and shelter, and more of the comforts of life. In England, in the last of the sixteenth century, a good mechanic, carpenter, mason, painter, wheelwright, earned a bushel of wheat by working nine days and one-eighth. And now, with the present prices of labor and grain, the same classes of mechanics in the United States earn a bushel of wheat in half a day."

Masons and bricklayers live to a fair age. Theirs is not, on the whole, as healthy or as ennobling as that of carpenters and joiners, and does not call for as varied activity of the mind.

Operatives are very unhealthy and short-lived. Working an excessive number of hours, amid the fearful, confusing clatter of machinery, in greasy, over-heated factories, and compelled to bolt down their meals in half the requisite time, we cannot wonder that indigestion and phthisis parch and shrivel their frames, and hurry them away at the early age of *thirty-eight*. Observations in England and America give about the same results.

Nearly all operatives, male and female, are mere routinists, going through their appointed toil with the blind regularity of the shafts and looms.

Draw-filing cast iron is a very injurious occupation. The dust is much more abundant, and the metallic particles much more minute, than in the filing of *wrought* iron. The particles rise so copiously as to blacken the mouth and nose. The men first feel the annoyance in the nostrils. The lining membrane discharges copiously for some time, and then becomes preternaturally dry. The air-tube is next affected. Respiration is difficult on any increase of exertion; and an habitual cough is at length produced. At the same time the digestive organs become impaired; and morning vomiting, or an ejection of mucus on first rising, is not infrequent. The disorder varies, of course, with the constitution of the individual; but a common termination, when men pursue the employment for years, is bronchial or tubercular consumption.

The *founders* of brass suffer from the inhalation of the volatilized metal. In the founding of *yellow* brass in particular, the evolution of oxide of zinc is very great. It immediately affects respiration; it less directly affects the digestive organs. The men suffer from difficulty of breathing, cough, pain at the stomach, and sometimes from vomiting in the morning. But it should be considered that many of our operatives and artisans are injured as much by the *discomforts and disagreeable surroundings* amid which they labor, as by these special causes, that are inseparably connected with many of the processes in the arts. Comfort as such is healthful.

"Easy beds and chairs, to give good support to the frame when working or when seeking rest; easy carriages for locomotion, smooth roads; varied clothing, suited to the different seasons, and well fitted to the body, trunk, and limbs; food well cooked and digestible, pleasant to the palate and light to the stomach—and manifold other accompaniments of cultivated society, sometimes called mere luxuries and contemptuously despised by the hardy, are yet more than mere luxuries; they in their several ways and degrees are necessary for the fulness of life, in power and duration, which is obtained only in the state of the highest civilization."—*Jarvis.*

Chemists and Druggists are exposed to various odors, and the evolution of gases, many of which are injurious. Hence the persons employed in laboratories are frequently sickly in appearance, and subject to serious affections of the lungs. There is no question, however, that druggists and chemists may and do attain advanced age. Chemistry, in its highest departments, calls for the best powers of the intellect. My remarks here chiefly refer to those who are engaged in preparing and dispensing chemicals and drugs.

Schools demand our particular attention. Children are crowded in rooms of disproportionate size. The air, consequently, is greatly contaminated, and the vital power is more or less reduced. Even where attention is paid to ventilation, the evil must, in a greater or less degree, exist in *large* schools. Children, and very young children, are kept, too, for many hours daily, in a state as nearly motionless as it is possible for the masters to produce. The time devoted to amusement is much too little. Instead of two or three hours a day being allowed for play, only two or three hours a day should be devoted to confinement and labor. To fix a child in a particular posture for hours, is vile tyranny, and a cruel restraint on nature.

Young ladies especially suffer from habits of schools. Their exercise is much too limited. Full romping exercise, exercise which brings all the muscles into play, is discouraged. It is vulgar to use the limbs as nature designed; it is vulgar to take the food which nature requires; and young ladies must not do anything that is vulgar. Sitting, moreover, for hours at needlework, or in learning what are called accomplishments, they leave a numerous class of muscles wasting for want of exercise. The muscles of the back are especially enfeebled,—and the spinal column, in youth comparatively soft and flexible, bends under the weight of the head and arms. The spine yields, because the muscles, which closely connect the bones, and by their action keep them in a proper line, are too weak. I am often asked, Why are spinal complaints so common? I answer, that a principal cause is the want of full exercise; we say that young persons are obliged to acquire what is of little or no use in after life, while they neglect what is necessary to the establishment of the body in health and vigor; in short, we have daily to lament that muscular exercise is so often sacrificed to accomplishments and to learning. If it be asked, why are girls more subject to distortion than boys, we reply, because they do not romp like boys. The amusements of boys are far more active than sedentary; those of girls are more sedentary than active. Several hours a day they must devote to music, and frequently a considerable time to the more injurious occupation of drawing; most of the remaining day they spend in finger occupations. Little time is devoted to exercise in the open air, and the exercise they *do* take is such as to chill, rather than invigorate the circulation.

Laborers on farms, and jobbers at various kinds of outdoor work, do not seem to live as long as many classes of artisans who are shut up in bad air, and with little exercise. Of upwards of 17,266 in Massachusetts, the average age was 46.74; of 305 in Boston, 40.30. Undoubtedly most of those thus registered as laborers were employed, more or less, in farm labor; and if country air, and country quiet, and country industry are sufficient to insure longevity, then ought they, at least, to have attained the age of fifty-five. But, as has been remarked, there is a wide gulf between the *status* of the manager of a farm and the workman hired by the month. The common laborer, owning no land, paying light taxes, feels no interest in his work, beyond the money value represented by it. While, then, his muscles grow hard and strong, his intellectual nature becomes dwarfed and stunted. His very fulness of habit invites and feeds every form of inflammation, and, unsustained by loftiness of moral or intellectual purpose, he easily succumbs and dies before his prime.

It should be considered, also, that laborers, printers, operatives in factories, and artisans generally, are very apt to form dissipated habits, consume large quantities of bad whiskey, breathe bad air, eat bad food, and are surrounded by bad home associations. All these influences—as well as their lack of brain-work—tend to make them short-lived.

Pilots, fishermen, and naval officers are usually very robust, and, in spite of irregularities and intemperance, are quite long-lived. Common sailors who remain before the mast die at forty-five; but those who rise to be commanders of vessels attain to a good old age. From these facts the inference is clear that the sea air, as such, is healthful, both for those who breathe it all their lives, as well as for the invalids who resort to it at intervals. The system does not necessarily become so accustomed to it as to fail to be benefited by its tonic powers, for many who spend their lives upon the ocean represent that appetite and health are much better at sea, even on long voyages, than on shore. Were it not for the healthful medicinal virtues of the sea air, their lives would probably be shorter than that of any class of laborers or artisans on shore.

On the other hand, rheumatism and consumption are very often brought on or aggravated by salt air, although there are cases where both of these diseases are cured by a long voyage. Rheumatism of the chronic variety is exceedingly common among seamen, and on shipboard is often obstinate against every form of treatment.

So far as the air of the sea is appetizing and invigorating to the general system, just so far is it beneficial to consumptives; but that it is irritating to the inflamed surfaces of the lungs, is proved by the experience of the majority of those who resort to it in advanced stages of the disease.

During the late war it was found that many landsmen in the navy were attacked with consumption in its rapid form within a few months after first going to sea; and many were discharged in the second and third stages of phthisis, who at the time of enlistment had never dreamed that they were particularly susceptible to the disease. Not a few who were taken on supply vessels from northern latitudes to southern, were sent back to die before serving out half their time.

On the whole, then, as pilots and fishermen and lighthouse keepers attain to such good longevity, it is fair to conclude that sea air is, in the main, conservative to health and life.

A few other classes remain to be noticed. *Manufacturers of white lead and friction matches* die early, for reasons too obvious to be stated.

Railroad conductors average but thirty-eight, according to statistics in Massachusetts; but it is not just to infer that the occupation is so very unhealthful, inasmuch as few remain in it after they become old. Yet, as brakemen, express and baggage men are also low down on the tables of longevity, the question arises whether continuous car-riding is not, of itself, injurious—aside from the liability to accident. Conductors, both on steam and horse railroads, frequently complain of general *malaise*, which they attribute to the continual jarring of the body caused by the motion and sudden stopping of the cars. The average age of 169 railway agents and conductors in Massachusetts is 39.14. Railway accidents, frequent and bloody as they are, will not account for the mortality among employés on the trains. Moreover, they breathe good air, and in nearly all other respects their life is not unhealthy.

It is important to be observed here that statistics of occupations are apt, in one way, to mislead us. *Certain occupations are followed chiefly by old persons, and others by those who are young, or, at least, not past middle life.* Thus, judges do not usually attain their position until somewhat well along in years. Statistics tell us that the average longevity of paupers is high. It would not be right to argue from this fact that pauperism is necessarily favorable to longevity, for many or *most of paupers are paupers because they are old and incapable of taking care of themselves.* School teachers do not usually follow their occupation for life, but only as a temporary expedient. A distinction must, of course, be made between teachers of district or private schools and professors in colleges, who usually make instruction a life calling. It will be found that the average longevity of professors is very high. Unquestionably the duties of a college professor are more favorable to health and longevity than those of the teachers; and yet it would not be fair to argue from statistics merely, since most of our teachers abandon their calling early in life.

Potters ought to attain a fair longevity. Their occupation labors under the same difficulty as that of many other artisans; it is too narrow in its sphere, and demands very little intellectual activity.

Tobacconists do not seem to be as much injured by their calling as was at one time supposed. It has been thought that working in tobacco had a bad effect on the health, but this theory is not sustained by sufficient evidence.

It is now proved, both by general observation and by statistics, that tobacconists are, if anything, healthier and longer-lived than the average ot indoor operatives. In some of the rooms of tobacco manufactories the workmen live in an atmosphere of tobacco dust, large quantities of which they must take into their lungs with each respiration; and yet they become so entirely accustomed to it that they not only are as free from disease as the average of operatives, but are really longer-lived. It is thought by some that working in tobacco protects the system from consumption and fevers, and some other diseases. The average age of 29 tobacconists in Massachusetts was 52.17 years. This is *four years* above that of active mechanics in shops, and only four below that of clergymen, lawyers, and physicians, who are noted for their longevity.

Operators on Sewing-Machines.—It is said that there are over *one million of sewing-machines* in the United States. All these have come into use within 25 years. This is a short time in which to test the effects of operating these machines on the longevity, and the statistical table on this special occupation sheds no light. Many physicians and other close observers now agree that operating on the sewing-machine for an *exclusive* occupation is injurious to the health, especially of women. In operating on our ordinary machines the body is in a sitting position, and only a limited number of muscles of the arms and limbs are used. The position is cramped and unnatural. The movements required become exceedingly tiresome. A very intelligent lady, of more than average health, once told me that half an hour at the sewing-machine completely exhausted her, and that it made her for the time exceedingly nervous.

Besides the general results, operating on sewing-machines sometimes injuriously influences the genital apparatus, and thereby, by its mechanical effects, may give rise to serious local disorder.

Finally, we observe that those occupations of women which are allied to and are a part of her duties as wife and mother, and mistress of the household, are more favorable to her longevity than the special trades.

The average age of 4,070 *females* (*of all classes*)	was	45.31 years.
" " " " 57 nurses	"	61.53 "
" " " " 2,309 housekeepers	"	50.33 "

The	average	age	of	361 domestics	was	46.15	years
“	“	“	“	195 seamstresses	“	45.81	“
“	“	“	“	154 tailoresses	“	45.16	“
“	“	“	“	37 shoebinders	“	43.84	“
“	“	“	“	147 dressmakers	“	41.90	“
“	“	“	“	29 straw-braiders	“	38.69	“
“	“	“	“	84 milliners	“	38.45	“
“	“	“	“	26 straw-sewers	“	31.92	“
“	“	“	“	205 teachers	“	29.99	“
“	“	“	“	466 operatives	“	28.07	“

It will be observed that there is here a regular gradation—that nurses, housekeepers, domestics, are quite long-lived, while those engaged in the special trades of straw-braiding, millinery, attain only an average age of less than *forty*.

It is not necessary to study statistics in order to know that women engaged in many of the special callings are less healthy than those who administer affairs of the household. Operatives in factories almost always have pale and sallow countenances. Dressmaking is far from being a healthy calling, but it is better adapted for woman's temperament and more consistent with long life than toiling in the confined and heated air of noisy factories. Female teachers are usually teachers because they are young. It is not ordinarily an occupation for life. As has been said above, many only teach for a few years of youth until they get married. The same remark will perhaps apply to some of the other trades and occupations in which women engage. Seamstresses, operatives, straw-braiders, often pursue these occupations simply as a temporary means of livelihood until they find a husband. Besides, it should be mentioned that many of these callings in which women engage are carried on in close and overheated apartments.

Making all allowances for the fact that *young* women are more apt to engage in these special trades, these facts are yet very significant.

When woman is allowed to participate actively in politics, and in professional and business life, it is probable that her longevity will be increased. Her present duties do not sufficiently exercise her brain. Home duties give more and a better variety of activity to the brain than working in the mills or standing behind the counter, and are therefore more healthful. In proportion as woman uses her fingers less and her brain more, in that proportion, other conditions being favorable, will she become longer-lived.

There is, then, a difference of at least ten years in favor of those who labor in the household. Stern necessity compels the widows and unmarried of civilized lands to engage in irksome mechanical employments, but it would be far better for woman's health and happiness if the laws of society made it more honorable to wait on the door and preside over chambers than to sew on coats or make straw hats.

Of the relative age of the married and the unmarried, these statistics give us no information.

It has been shown, however, by other statistics, that the *married live much longer than the unmarried;* that widows and widowers have less expectation of life than if they remained all their lives in the married state.

It is a very suggestive argument in favor of the healthfulness of the married state that, in spite of all its necessary cares, and anxieties, and distresses, in spite of its frequent and life-long uncongeniality and misery, in spite of the sorrows of parturition, and all the nameless trials that children cause their parents, yet the married live much longer than the spinsters and bachelors.

This fact is also an argument in favor of the healthfulness of labor of the brain. The brains of the married are usually much more active than those of bachelors and old maids. They have weightier and more numerous cares. They have severer anxieties. The care of the children, the unnumbered duties of the household, the perpetual battle for bread and shelter, the continuous planning and forecasting, the constant activity of the emotional and moral nature—all these things, *on the average*, tend to health and longevity.

On this important subject of longevity, Dr. J. V. C. Smith remarks as follows:

"1st. Short persons, of sound constitutions, unimpaired by violations of natural laws of health, have a prospect of a longer life than tall persons, all other circumstances being equal.

"2d. Females having particularly long necks have shorter chests and narrower at the base than those whose necks are of the ordinary appearance.

"3d. Diseases of the lungs do more frequently exist in tall men than in those of medium height, or those between five feet seven inches and five feet nine; and a hereditary tendency to pulmonary consumption is thought to be found in tall families more frequently than in others.

"4th. When pulmonary disease is hereditary in a family, children are not unfrequently born with tubercles in the tissues of the lungs. Years may be required to develop them, unless they are subjected to some exciting causes. Slight inflammatory action in the mucous membrane of the bronchial tubes sometimes suddenly extends to them and quickens them into activity, and ulceration soon appears, destroying the delicate texture of the neighboring air-cells, interrupting the aëration of the blood, and death follows."

DR. GRISCOM'S PORTRAITURE OF A MAN DESTINED TO LONGEVITY.

"A fully developed *osseous frame* and *muscular* organization.
Stature not too tall, rather middle size, somewhat thick-set.
A capacious chest.
Shoulders rather round than flat.
Pulse strong and regular.
Veins full at extremities.
Head not too large.
Neck neither very long nor short.
Abdomen not projecting.
Hands large, but not too deeply cleft.
Foot rather thick, and broad than long.
Skin strong, smooth and clear.
Complexion not too florid, nor too ruddy in youth.
Hair approaching rather the fair than black.
Voice strong, with faculty of retaining the breath long without difficulty.
Senses acute and clear, but not too delicate.
Appetite good and *digestion* easy.
Teeth sound, eats slowly, without extra thirst.
Excretions all regular and free.
No violent passion.
Temperament sanguine, with a little of the phlegmatic.

Dr. Smith says: "Both men and women born of parentage remarkable for longevity inherit vitality, and are generally tenacious of life. They occasionally reach a very advanced period, being rarely the victims of acute or epidemic diseases.

"2d. Children born of parents one but not both of whom inherited long life, do not equally inherit vitality. In any considerable number of brothers and sisters born, some of them will live to be aged, but not all.

"3d. Men or women with particularly long bodies, otherwise well developed, and governed by all the circumstances and conditions heretofore noted, give satisfactory physical signs of a long life.

"4th. Married women who have borne children, if in comfortable circumstances, especially in the country, have the prospect of a longer life than those who were never mothers.

"5th. Widows have not the prospect of so long a life as married women.

"6th. Widowers have not a prospect of so long a life as married men. Married persons, if happily connected, have a prospect of a longer life than the unmarried.

"7th. Unmarried women in health, easy in their circumstances, and pleasantly conditioned in society, have the prospect of a longer life than unmarried men of the same social condition.

"8th. Unmarried women, dependent upon their personal efforts and harassed by anxieties, have not a prospect of a long life.

"9th. Excitable, fractious men or women, when married, who are subject to paroxysms of sudden anger, peril their prospects for a long life.

"10th. Both men and women, although in easy circumstances, if of a jealous, irritable disposition, or subject to morose exhibitions of temper—married or unmarried—have not a prospect of long life. Still a few out of many may sometimes live to be aged.

"11th. Men or women who have changed their residence from a cold or moderately temperate climate of one continent to a similar climate in another, if comfortable in their circumstances and industrious and correct in their habits, do not have their vitality impaired.

"12th. Men or women who thus remove from one continent, as from Europe to America, or from America to Europe, if inclined to excesses which impair the vital force, may die prematurely."

LONGEVITY OF AMIMALS.

This is a subject of exceeding interest, and is very suggestive.

Hufeland, in his excellent work, "The Art of Prolonging Life," has some reliable facts and theories in regard to longevity that I present below.

The facts he records are reliable, even though we may not agree with all of his theories.

Among other general principles he enumerates the following:—

"1*st.* *Bulk shows a greater provision of the vital or plastic power.*

"2*d.* *Bulk gives more vital capacity, more surface, more external access.*

"3d. *The greater mass a body has, the more time is required before it can be wasted by its external and internal consumptive and destructive powers.*"

"Of the tenacity of life we have instances truly astonishing. *Tortoises* have been seen to live a considerable time without the head; and frogs when their hearts were torn out have still continued to leap about. A *tortoise has existed six whole weeks without any food;* and this sufficiently shows how small its intensive life is, and how little need it has of restoration. Nay, it is proved that toads have been found alive inclosed in stones and blocks of marble. Whether they were shut up there in the egg or as perfect beings, both cases are equally astonishing; for what a number of years must have been necessary for the marble to generate, and before it could acquire its solidity!

"This shows how much influence the power of regeneration has in prolonging life. A great many dangers and causes of death are thereby rendered harmless; and whole parts which have been lost are again renewed.

"To this belongs that phenomenon of the skin which we find among most animals of this class.

"*Snakes, frogs, lizards, &c.*, cast their skin every year; and it appears that this method of becoming again young contributes very much to their support and duration. Something of the like kind seems to prevail throughout the whole animal world; birds change their feathers, as wells as their bills, which is called moulting; insects transform themselves, and most quadrupeds change their hair and their claws.

"*The tortoise and crocodile attain to the highest age, as far as we have yet been able to learn from observation.*

"*The tortoise*, an indolent, slow in all its motions, and phlegmatic animal, and which is so long in growing that in twenty years one can scarcely observe an increase of a few inches, lives to the age of a hundred years and more.

"*The crocodile*, a large, strong, vigorous animal, enclosed in a hard coat of mail, incredibly voracious, and endowed with extraordinary powers of digestion, lives also very long, and, according to the affirmation of several travellers, is the only animal which grows as long as it exists.

"It is astonishing what instances of great age may be found among *fishes, the cold-blooded* inhabitants of the waters. We know from the ancient Roman history that in the imperial fish-ponds there were several lampreys (murænæ) which had attained to their sixtieth year, and which had at length become so well acquainted and familiar with man, that *Crassus, orator, unam ex illis de fleverit* The pike, a dry, exceedingly voracious animal, and carp also, according to undeniable testimony, prolong their life to a hundred and fifty years. The salmon grows rapidly, and dies soon. On the other hand, the perch, the growth of which is slower, preserves its existence longer. It appears here worthy of being remarked, that natural death occurs more rarely among fishes than in any other part of the animal kingdom.

"The law of the transition of one into another according to the right of the strongest prevails here far more generally. One devours another—the stronger the weaker; and one may assert that death exists less in the water, as the dying pass immediately into the substance of another living being, and consequently the intermediate state of death is less common than on land. Putrefaction takes place in the stomach of the stronger. This regulation is a proof of exalted and divine wisdom. *If the innumerable millions of the inhabitants of the waters which die daily remained only one day unentombed, or, what is the same thing, not devoured, they would speedily diffuse abroad the most dreadful pestilential evaporation. In water, where vegetation, that great means of correcting animal putrefaction, exists in less extent, every cause of corruption must be guarded against, and on this account continual life must prevail.*"

According to Grindon, "*the longest-living mammal, after the whale, appears to be that affectionate, docile, and sagacious creature, the elephant.* Nothing is known positively as to its lease, but the estimate of one hundred and fifty years is certainly not beyond the mark. The rhinoceros and the hippopotamus are reputed to come next, a maximum of seventy or eighty being assigned to each of these huge brutes; then, it is said, follows the camel, a meagre, dry, active, exceedingly hardy animal, whose useful life extends not infrequently to fifty. The period, reckoning by decrements, between fifty and thirty is reached by few. The stag, longæval only in romance, dies at thirty-five or thereabouts; the leopard, bear, and tiger fail fully ten years earlier; twenty-five or thirty is the ordinary maximum of the horse and ass, though the severe treatment of man rarely allows them to reach even this.

"The mule, it is worthy of notice, is stronger lived and becomes older—a circumstance anticipated in plants, where hybrids frequently live longer than their parents. The cause is probably the same in both, and to be found in their infertility, whereby their whole vigor is left at liberty for self-maintenance, instead of being expended in two directions. Many leases expire between twenty and ten.

The former seems to be the ordinary maximum of the lion as reached in menageries, though when unconfined it evidently lives longer, for it has sometimes been found without teeth. Twenty is the limit also with the bull, despite his great strength, size, and solidity; the dog and the wolf seldom pass eighteen; the sheep, the goat, and the fox rarely live more than twelve.

"The *maximum of the domestic cat is said to be ten*, that of the *rabbit*, hare, and guinea-pig *seven or eight*, that of the *mouse five or six*, and of other such little animals about the same. As to the leases of the remainder of the four-footed creatures of our planet, excepting a dozen or so, zoology is entirely uninformed, and until they shall have been ascertained of course nothing like a proper list can be constructed. The animals which have been mentioned are certainly among the chief, and indicate the scope and limits which a table of ages when completed will exhibit; but so far the list is only like a boy's first map—unfurnished, except with the names of the seas, the metropolis, and his native town. *One thing is plain, that man, regarded as a member of the animal kingdom, has no occasion to murmur at the shortness of his lease of life; but should rather congratulate himself, seeing that he enjoys a considerably longer term, even in his ordinary duration, than the great mass of his physiological fraternity; while it is pretty certain that there is not an animal of his own size that does not return to dust before half as old.* The scale of ages attained by birds is much about the same as that of mammals, but taking one with another they probably live longer in proportion to their bulk. No creatures are better adapted for longevity—they are peculiarly well clothed, for no covering can be more complete, or better calculated to preserve warmth than their soft, close-lying feathers; and as these are renewed periodically they are maintained in the best possible condition. Many birds also cast their beaks and acquire new ones—a most advantageous exchange for them, since they are thereby rendered so much the better able to feed themselves. Besides these peculiarities, birds live almost entirely in the fresh air, and their habits are cheerful and sportive—conditions eminently conducive to long life.

"As to the particular terms of life which obtain among them, Flourens says he knows 'nothing certain.' *There is plenty of evidence, nevertheless, that such birds as the eagle, the vulture, the falcon, and the swan, far surpass all others in longevity, and attain ages so remarkable as often to exceed very considerably that of man. Even the crow is reputed to live a hundred years, and the raven no less than ninety.*

"There have been instances of the parrot living for sixty years a prisoner, and its age when captured would have to be added. Pelicans and herons are said to reach forty to fifty years; hawks thirty to forty; peacocks, goldfinches, and blackbirds about twenty; pheasants and pigeons about the same; nightingales fifteen, the robin a little less; domestic fowls about ten; thrushes eight or nine; wrens two or three. Concerning the ages of fishes even less is known than about birds. It is vaguely believed of them that they are longæval. The reasons for this opinion are, that the element in which they live is more uniform in its condition than the atmosphere, and that they are less subject in consequence to those injurious influences which tend to shorten the lives of terrestrial creatures; and, secondly, that their bones, being of a more cartilaginous nature than those of land animals, admit of almost indefinite extension, so that the frame is longer in growing to maturity.

In regard to the longevity of tortoises, Grindon substantially indorses the views of Hufeland above quoted.

"Reptiles attain surprising ages. The tortoise, which is so slow in growing that in twenty years an increase of a few inches is all that can be detected, has lived even in captivity above a century. One placed in the garden of Lambeth Palace, in the time of Archbishop Laud, lived there till the year 1753; and its death was then induced seemingly through misfortune rather than old age.

"The enormous creatures of this kind, natives of the Galapagos, undoubtedly live twice or thrice as long as the common species. An individual possessed some years back by the London Zoological Society had every appearance of being at least a hundred and seventy-five. Even these immense ages were probably far exceeded by the great fossil testudinata of the Himalayas. It is easy to see the cause of such longevity. The same law which obtains in the mechanics of inanimate matter operates in the organisms of vitalized matter—namely, that which is gained in time must be lost in power. The active habits which in short-lived animals accelerate the vital processes and bring the lease to an early close, here are no longer found.

"The tortoises have no excitable nervous system to wear out the durable materials incased in their impenetrable armor. They spend the greater part of their lives in inactivity, and exist rather than live. By analogy it may be inferred that the loricate and ophidian reptiles reach an age fully as advanced as the tortoises. The crocodile, large, strong, vigorous, enclosed in a coat of mail, and incredibly voracious, is without doubt exceedingly long-lived. The larger serpents, also slow in growth, and passing a considerable portion of their lives in semi-torpor, are also unquestionably longæval. Feeding voraciously at long intervals, so familiar in the case of serpents, seems invariably associated with prolonged life. As regards the amphibia, Smellie refers to a toad known to have been at least thirty-six. The frog, which by reason of its slow growth in this climate, at least, is incapable of producing young till its fourth year, reaches, however, what in proportion to this late puberty is the very inconsiderable age of no more than from twelve to about sixteen. Insects for the most part are short-lived, especially after their last transformation. Some after acquiring their wings live for only the remainder of the day.

"*In calculating the ages of insects, of course, they must be reckoned from the hatching of the egg. Different species exist two, three, and even four years in the grub state, then a considerable time in the chrysalis, the winged state being merely that of completed maturity.* That which especially marks the latter is the fitness of the creature for propagation, and this as the period of its bloom is also the briefest. *The ephemeræ in their winged state are not even creatures of a day. Scarcely a single gnat as such survives a week; not half the beetles, nor any of the grasshoppers nor lipulæ, those long-legged dancers of the autumn, enter on a second month. A fortnight sees the death of almost every kind of butterfly and moth.* One of the longest-living insects is that brilliant beetle, the *scarabæus auratus*, or rose-chaffer—the only one that feeds upon the flower from which it takes its English name.

"After four years spent as a grub and a fortnight as a chrysalis, it has lived in captivity from two to three years more. That curious but treacherous and cruel creature, the *mantis religiosa*, or praying cricket, which holds up the foremost pair of its long, desiccated, skeleton legs, as if in the act of prayer, is said to attain a full octave."

LONGEVITY OF TREES AND PLANTS.

It is quite difficult to obtain reliable facts from observation in regard to the age of trees, because some species live hundreds and thousands of years, and must therefore be watched by many generations of men in order to ascertain their exact age. It is therefore customary to count *the rings that are formed* in the growth of trees that attain to great age.

On this subject Hufeland writes as follows:

"Plants may all, however, be reduced, according to their duration of life, into *three* principal classes: *annual, or properly only semi-annual, which grow up in spring and die in autumn;*

biennial, which die at the end of the second year; and, lastly, perennial, the duration of which extends from four to a thousand years.

"All plants of a soft, watery constitution, and which have fine, tender organs, have a short life, and last only one or at most two years. Those alone which have stronger organs and tougher juices exist longer, but wood is absolutely necessary in order to attain to the highest degree of vegetable existence.

"Even among those which live only one or two years, a remarkable difference may be observed. Those which are of a cold, insipid nature, and destitute of smell, live, under like circumstances, not so long as the strong-scented balsamic plants, which contain more essential oil and spirits.

"*Lettuce, wheat, oats, barley, and all kinds of corn live no more than a year;* but, on the other hand, thyme, mint, hyssop, balm, wormwood, marjoram, sage, &c., can live two years, and even longer. *Shrubs and small trees can live sixty years*, and some even twice that number.

"The *vine* attains to *sixty or a hundred* years, and continues fruitful at the greatest age. This is the case also with rosemary. The acanthus and ivy, however, can exceed the age of a hundred. Among many such, for example, as the different kinds of *rubus* (common bramble, blackberry, raspberry), it is difficult to determine the age, as the branches creep along the ground and always form new plants, so that it is almost impossible to distinguish the new from the old; and by these means they make their existence, as it were, perennial. Those which attain to the highest age are the greatest, strongest, and hardest trees; such as the oak, the lime-tree, the beech, the chestnut, the elm, the palm-tree, the cedar, the olive, the palm, the mulberry-tree, and the baobab. We may with certainty affirm that some of the cedars of Lebanon, the celebrated chestnut tree, *di centi cavalli*, in Sicily, and several of the sacred oaks under which the ancient Germans performed their religious ceremonies, may have attained to the age of a thousand years and more. These are the most venerable, the only now existing testimonies of the ancient world, and inspire us with reverence and awe when the rustling wind plays through their silvery locks, which once served to overshade the Druids and our wild ancestors clothed in their bear-skins."

Grindon remarks on the longevity of trees:

"How vast are the periods of life allotted to the longæval trees may be judged from the following list of ages known to have been reached by patriarchs of the respective kinds:

"Cercis	300 years.	Walnut	900 years.
Elm	335 "	Oriental Plane	1,000 "
Ivy	450 "	Lime	1,100 "
Maple	516 "	Spruce	1,200 "
Larch	576 "	Oak	1,500 "
Orange	630 "	Cedar	2,000 "
Cypress	800 "	Schubertia	3,000 "
* Olive	800 "	Yew	3,200 "

"Four and five thousand years are assigned to the *Taxodium* and the *Adansonia*, and *Von Martius* describes locust-trees in the South American forests which he believes to have begun their *quasi* immortality in the days of Homer. Whether or no, it may safely be asserted that the world possesses at this moment *living* memorials of antiquity at least as old as the most ancient monuments of human art. How grand and solemn is even the thought of a tree coeval with the pyramids of Egypt and the sculptures of Nineveh, yet still putting forth leaves, and inviting the birds to come and 'sing among the branches!'

"Well might the old preacher of Alexandria discern in a tree *the terrestrial image of heavenly truth.*

"*The age may be estimated by ascertaining as nearly as possible the annual rate of increase, then taking the diameter of the trunk at about a yard from the ground, and calculating by rule of three.* Thus, if in the space of an inch there be an average of five annual layers, a hundred inches will indicate five hundred years of life. The latter method requires to be used, however, with extreme caution, because of the varying rate of earlier periods of life, trees increase much faster than when adult. The oak, for instance, grows most rapidly between its twentieth and thirtieth years, and when old the annual deposits considerably diminish, so that the strata are thinner and the rings proportionably closer. Some of the oak become thinner after forty, those of the elm after fifty, those of the yew after sixty. Unless allowance be made for this, and also for the irregular thickness of the layers, which vary with the positions of the tree in regard to the sun, errors are inevitable.

There are trees which are altogether destitute of rings. These belong to the class called *endogens*, of which the noblest and typical form is the *palm*. Here the sign of age is usually furnished by the scars or stumps of the fallen leaves, which are of prodigious size, few in number, and produced only upon the summit of the lofty, slender, and branchless trunk. A certain number of new leaves expand every year, and about an equal number of the oldest decay; so that, by taking the total of the scars, and dividing it by the average annual development of new leaves, a tolerable approximation may be come to. But it can rarely be relied upon; it is a method, indeed, by no means universally practicable, the scars of the fallen leaves being very variable in their degree of permanence in different species.

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* There are olive-trees in the supposed garden of Gethsemane which have been *estimated at 2,000 years;* but these are probably mere descendants of those connected with the narratives of the Gospel, put forth originally as suckers from their roots, and to be regarded rather as restorations than as identically the same.

Of the *potential* longevity of a tree or plant, a fair estimate may be arrived at from a variety of circumstances.

For example, there are relations between the duration of life and the quality of the *fruit* which plants produce. Those which give tender and juicy fruit, or at all events such trees as do this, are in general shorter-lived than those which yield hard and dry fruit, and these are shorter-lived than such as produce only little seeds. The apple and the pear live shorter lives than nut-trees, which are outlived in turn by the birch and the elm, as these are by the major part of the coniferæ, in which family there is probably not a species that does not flourish for at least a hundred years.

The *Alpine* firs and *larches* frequently attain *five centuries*, and even the common red pine and the Scotch fir reach three to four. With a few exceptions, the seeds of the whole family are noticeably small, though the containing cones may be of considerable size. One of the greatest trees in the world, the *Wellingtonia gigantea* of California, a member of this tribe, with an estimated maximum age of 2,000 years, has a beautifully formed but remarkably small cone, and seeds in proportion. Such trees as the birch, the elm, and the conifers are useful to man for their timber, a service rarely rendered by the fruit-bearers. Trees, again, that yield pleasant fruit fit for human food ordinarily live for shorter periods than those of which the produce is bitter and austere and unserviceable to man as an edible. *Most, if not all of the plants on which man in his civilized state depends for food, are exceedingly short-lived.* The cerealia or corn-producing plants, as wheat, rice, barley, and oats, are annuals, without exception; so are nearly all kinds of pulse. The large classes of esculent vegetables, represented by the turnip, carrot, and cabbage, are also either annual or biennial.

"How much man has benefited by this wise arrangement, it is impossible to estimate. Did his daily bread grow on longæval trees.

like acorns, asking no care and toil, the most efficient means to his development would have been wanting, as is still evidenced in the lands of the cocoa-nut and the banana; but depending, as he has been so largely obliged to do, on *annual* plants demanding incessant care, they may be gratefully regarded as the prime instrument of his rise in intelligence and morals.

"It may be taken as an axiom in vegetable physiology, that, *cæteris paribus*, no plant dies a natural death until it has ripened seeds. If its life be endangered by penury of food or mutilation, the entire vital energy of the plant concentrates itself in the production of a flower, it ceases to put forth leaves, and expends its whole force in efforts to secure progeny.

"This is strikingly exemplified in hot, dry gardens, and by summer waysides, where, as if conscious of the impending danger, plants ordinarily of considerable stature begin to propagate while scarcely an inch high."

THE LAWS OF HEREDITARY DESCENT.

The laws of hereditary descent are the most potent of all the influences that determine the character and destinies of individuals and of nations. *Climate* and *diet*, powerful as they are, must always yield to the unconquerable might of *race*, and can of themselves work only incidental and transient changes in the original types.

The fundamental law of hereditary descent that has been ascertained by science and experience is, *that every quality of organic existence tends to be hereditary.* This law, so far from being a truism, as it might at first appear, has not been even approximately understood until recent times, and even now is not generally recognized or appreciated. Not only the general characteristics of mind and body, but also the distinct peculiarities of look, voice, manner, all the parts of the system, must be equally or nearly so. The transmissibility of exceptional formations, such as supernumerary fingers or toes, can only be explained by the general law that every quality of organic existence tends to be hereditary.

The transmissibility of physical peculiarities were very well illustrated by the celebrated Lambert family, or "*porcupine men.*" Edward Lambert, when a boy of fourteen, was exhibited to the

Royal Society, and was then described as having a skin that resembled the bark of a tree. "The bristly parts, which were chiefly about the belly and flanks, looked and rustled like the bristles or quills of a hedgehog, shorn off within an inch of the skin." The boy grew to be a good-looking and healthy man. He married, and had six children, *all of whom had the same covering as their father.*

All constitutional, and very many local diseases, or tendencies to diseases, may be hereditary. It has been, and is now, the custom to speak of the hereditariness of certain maladies, as consumption and the like, as though they were exceptions to the general law. The truth is that all vices of the system may be transmitted. Consumption, being a frequent as well as very fatal disease, has long been recognized as transmissible; but it may be questioned whether it is any more so than many other diseases, which are less serious in their issue, and, therefore, less dreaded and less observed. Gout and rheumatism are very transmissible, especially the former. Probably there are very few cases of the constitutional varieties of these diseases that cannot be traced to some of the ancestors of the sufferer. Insanity, apoplexy, and other symptoms of cerebral diseases, are certainly as transmissible as tuberculosis of the lungs. We may say, in general, that all diseases of the nervous system are very hereditary. Some families exhibit through many generations a tendency to disorder of the digestive system, and complain of dyspepsia and derangement of the liver and bowels. Others inherit weakness of the circulating apparatus, and are annoyed by affections of the heart, such as enlargement, dilatation. A hereditary tendency to nervous disease may break out in one member of a family as St. Vitus' dance, in another as epilepsy, and in another as apoplexy with paralysis; or it may manifest itself in the form of hypochondriasis, or actual insanity. The records of insanity alone—which is merely one of the symptoms of the tendency to nervous disease—show that a very marked proportion are hereditary. Mr. Sedgwick records the case of a man whose brother, father, and four uncles were all insane; and of a Jew whose father, mother, and six brothers and sisters were all victims of the same disease. Suicide, which is one of the results of insanity, also seems to run in families, and instances have been recorded where a large number of near relatives have died by their own hands.

Many of the diseases of special organs are also subjected to inheritance. Cataract, strabismus or squinting, long and short-sightedness, the incapacity of distinguishing colors, and some forms of amaurosis, are also hereditary. Certain morbid conditions of the middle ear, that give rise to deaf-mutism, are also transmitted from parents to offspring. Thus our illustrations might be extended almost indefinitely. It must, however, be allowed that we very often fail in determining the hereditability of many of these diseases, especially when we are misled, as we are so often apt to be, by the *name* of the symptom. Certain skin diseases, with their large variety of modifications, are transmitted from parent to offspring; and especially is this true of those maladies that are the direct punishment of vice. Baldness and premature grayness of hair run in families to a very marked degree, and without any seeming dependence on the general health.

In the animal creation, so far as has been observed, diseases and morbid conditions are as hereditary as in man. One of our highest authorities on this subject—Youatt—states very emphatically that "there is scarcely a malady to which the horse is subject which is not hereditary." Darwin, who has traversed the whole literature of the subject, states that all authors agree that "contracted feet, ring-bones, curbs, splints, spavin, founder, and weakness of the front legs, roaring or broken and thick wind, melanosis, specific ophthalmia and blindness, crib-biting, jibbing, and ill-temper, are all plainly hereditary." The diseases of cattle are probably just as transmissible as those of horses; but they have not been studied as minutely, and therefore the facts on the subject are not as abundant or reliable.

But, very fortunately, this subject has a brighter aspect. Good qualities are just as liable to inheritance as bad ones, and the characteristics of physical strength, health, and endurance may be as permanent in different generations as incidental diseases or deformities. The single quality of physical size may characterize even widely divergent branches of a family through many generations. There is no one who cannot recall, more or less, families, most of whose members are noted for striking tallness or largeness of form. King Frederick of Prussia collected an army of very tall men, and it was remarked that their descendants in the vicinity where they were quartered were of remarkable stature. Hardness and firmness of muscle, united with a very small amount of adipose tissue and a great capacity of endurance—the signs of what is known as the bilious organization—are family characteristics. I know a family, some of whose members, even in quite divergent branches, are noticeable for their thinness, the hardness of their muscles, and general wiriness of constitution, that renders them capable of undergoing much and living long, though seemingly very frail. Plethora and pursiness are transmissible, and may characterize the weakly as well as the strong. Fat, when excessive, is a sign of disease, or, at least, of a morbid tendency; and when it is the result of a strong hereditary disposition, all attempts to retard or limit its formation are very discouraging. For remarks on this subject, see *Corpulence.*

Another law of hereditary descent is, that inherited qualities manifest themselves at corresponding ages, and harmoniously with each other. But I have not space to develop this subject in detail, interesting and suggestive though it be.

It is not unfrequently the case that the children of talented ancestors, after a youth of idleness or stupidity, are suddenly, at the outset of maturity, transformed into energetic and efficient members of society, and ever afterward prove themselves worthy of those from whom they are descended. We are often surprised that the children of sober and industrious parents are wild and lawless, and we are inclined therefore to doubt the potency of hereditary influence; but if we look back far enough we shall find oftentimes that their fathers or some of their ancestors were similarly wild and lawless in their youth, and were only converted on reaching mature years. It is a fact which I have long observed, that the children of pious and intelligent parents, however reckless or dissipated they may be in their younger days, usually grow up to be worthy and useful citizens. Those who are inclined to lose their faith in the power of hereditary descent, or in the truth of the inspired promise, "Train up a child in the way he should go, and when he is old he will not depart from it," because they see so much of degeneracy and vice in the offspring of noble and illustrious ancestry, would often find consolation in the subsequent career of those who began life by disgracing their parentage. It is often said that the children of clergymen are worse than those of any other class; but statistical facts and general observation prove directly the contrary. If the sons of clergymen, especially in our large cities, oftentimes rebel against moral and social laws, just like thousands of others whose fathers do not happen to be so conspicuously before the community, it is nevertheless true that in after years they often develop entirely new phases of character from early manhood to old age, prove themselves honorable and useful, and not unfrequently acquire distinguished fame in various departments of human activity.

In regard to *hereditary genius*, these points can, I think, be established by statistics:

1. That the great majority of the talented and distinguished of both sexes are closely related to others who are similarly distinguished, or who, at least, have more than average ability.

2. That not only general intellectuality, but special aptitude for literature, music, art, war, politics, and finance run in families so markedly, that men of genius, who number no one of superiority or eminence among their kinsmen, are to be regarded as exceptions.

3. The tendency is for talent to concentrate itself in families. The number of intellectually aristocratic houses is continually increasing, even under our democratic institutions, and must continue to do so in the future more than in the past, because society is becoming more and more stable.

If our marriages were arranged from motives of advantage and not of affection, the brains of the country might in time become almost exclusively concentrated in a limited number of powerful families.

Another law of hereditary descent is, that *the qualities of organic existence may be derived from very remote as well as from immediate ancestors.* This law is a logical inference from the first, and like that applies more or less to all organic life. It has long been observed by breeders that animals exhibit a tendency to assume the peculiarities of distant ancestors, and this tendency has been variously designated as *reversion* or *atavism.*

A want of a proper knowledge on this subject has led to a great deal of confusion and obscurity, both in the minds of the profession and of the laity. Hereditary diseases of all kinds are liable to skip a number of generations, and when they reappear in a family are oftentimes regarded as spontaneous by those who do not look back into the history of the progenitors. Parents who are themselves in perfect health, and whose ancestors, so far back as they may remember, died at an advanced age, are sometimes astonished by the appearance among their children of consumption, or some other hereditary disease, that may have skipped, perhaps, a number of generations. Insanity, epilepsy, St. Vitus' dance, and all the manifold diseases of the nervous system, are thus hereditary.

It must be conceded that these constitutional diseases cannot in all cases be traced to a hereditary origin. There are throughout the land many cases of consumption, of insanity, of epilepsy, that cannot be said to be the heritage of any ancestry, distant or remote. There are in our modern society thousands of exciting causes that may bring on constitutional disease, even when no hereditary taint exists; and yet, if we study closely into family history, we shall find that the number of such cases is much less than is commonly believed. In the majority of instances of constitutional disease, exciting causes act upon a hereditary tendency.

INTERMARRIAGE OF RELATIONS.

This is a question that has attracted deserved attention. The most varying opinions have been expressed, and are now held by the profession on this subject. There are those who hold that it is wrong for blood relations to intermarry, who are utterly opposed to the union of cousins of the first degree, because the offspring of such marriages are apt to be degenerate. There are those, on the other hand, who believe that the offspring of blood relations who intermarry is not in the average less healthy than are the children of those who are not related to each-other. Statistics have been collected on both sides, but the weight of evidence seems to show that the popular impression is correct, and that the children of cousins who marry are not as healthy as the average.

That very near relatives—brothers, sisters—should not marry, is abundantly clear. The instincts of mankind, the laws, customs, and usages of all nations, barbarous as well as civilized, are opposed to the crime of incest.

The only doubt is in regard to the marriage of *cousins*. My own view is, that the difference between marrying cousins and marrying nearer relatives is only one of *degree.*

As a general rule, cousins should not marry and yet it is not necessary that the rule should be rigidly observed It is much better to marry a cousin than to marry one who inherits a positive tendency to insanity, or even to consumption. When cousins marry there is danger that any *evil tendency that may exist in the family may be heightened; but cousins are not necessarily related.* Persons may be cousins by name and by law, and yet have no traits or elements in common. They may be so widely separated from each other by the influence of the families into whom their parents married, that they are really of different blood. It is obvious that such persons may marry, and should have as healthy offspring as though they were not *legally* cousins.

Each case must be studied by itself. There is no unvarying law.

On the other hand, cousins, even of the third degree, who closely resemble each other in important features of mind or body, who give unmistakable evidences of having descended from a common stock, ought not to marry. Here, also, each case must be studied by itself.

These are the conclusions to which I have gradually arrived, and which, if I mistake not, the profession are slowly beginning to accept.

The scope of this book will not allow me to discuss the subject in any greater detail.

Dr. Nathan Allen, of Lowell, who has written excellently for the people on kindred subjects, has recently sent me a pamphlet on the Intermarriage of Relations, from which I make the following extracts:

"Dr. S. M. Bemiss, of Louisville, Ky., published a large collection of facts bearing on this subject in the *North American Medico-Chirurgical Review* for 1857. Says he: 'By much labor I have obtained statistical accounts of 34 marriages of consanguinity; of this number 28 were between first cousins, and 6 between second cousins. Of the total number of marriages, 27 were fruitful and 7 sterile. The 27 fruitful unions produced 192 children. Of the 28 marriages of cousins, 23 were fruitful and 5 sterile; of the 6 marriages of second cousins, 4 were fruitful and 2 sterile. In both these latter instances of sterility the female was the product of a marriage of consanguinity.

"'Of the 192 children resulting from these marriages, 58 perished in early life. In 24 of the 58 deaths the causes were stated as follows: Of consumption, 15; of spasmodic affections, 8; of hydrocephalus, 1. Of the 134 who arrived at maturity, 46 are reported as healthy; 32 are set down as deteriorated, but without absolute indications of disease; and 9 are returned without any statement as to health or condition. The remaining 47 all possess such abnormities as to render them the subjects of particular observation. These are classed as follows: 23 are scrofulous; 4 are epileptics; 2 are insane; 2 are mutes; 4 are idiots; 2 are blind; 2 are deformed; 5 are albinos; one has chorea, and 6 have defective vision. While these statistics present a goodly number of children, there was an unusual number tuberculous (15 dying of consumption) or scrofulous (23), making 38 in this class. Nearly one-half inherited, probably, an imperfect organization.'

"In the Transactions of the American Medical Association for 1858 is an extended paper by Dr. Bemiss on this subject, made up mostly of tables, reporting 833 such marriages, giving the time of marriage, the occupation, the temperament, the health, habits, etc., of the parents, with the number of children, their defects, peculiarities, etc., etc. The whole number of children was 3,942, of which 1,134 were defective; 145 deaf and dumb, 85 blind, 308 idiotic, 38 insane, 60 epileptic, 300 scrofulous, 98 deformed, and 883 died early. The proportion reported deaf and dumb, blind, idiotic, scrofulous, and deformed, is altogether larger than what would be found among the children of families in the community, taking them indiscriminately. The degree of relationship in these cases is thus given: 10 marriages between brother and sister, or parent and child; 12 between uncle and niece, or aunt and nephew; 61 between blood-relations, who were themselves the descendants of blood-relations; 27 between double-first cousins; 600 between first cousins; 120 between second cousins, and 13 between third cousins. In a careful examination of the several degrees of consanguinity here given, the hereditary effects are found to be the worst in the first and second degrees, in the third not so bad; but when we come to the fourth, fifth, and sixth, the difference is not so perceptible."

"These statistics of Dr. Bemiss, already referred to, were carefully collected, mostly by medical men, from almost every State in the Union, and from no extreme point of view; they may be considered, therefore, as a fair and correct representation of the case as it is found in all grades or classes of society. This report gives 580 instances of intermarriage of cousins, resulting in 2,778 children, of which 793 were defective; 117 deaf and dumb; 63 blind; 231 idiotic; 24 insane; 44 epileptic; 189 scrofulous; 53 deformed; and 637 died early.

"The proportion of offspring here reported as defective, diseased, constitutionally impaired in body or mind, is certainly much larger than what would be found in the same number of children taken from the same number of families indiscriminately in the community. This same report embraces a large number of such marriages where there were few children with defective, diseased, or impaired organization; and also some families among them having numerous offspring, very healthy and promising in character. These were instances where the parents had not only good sound constitutions, but temperaments and a physical organization different, so that the parties were well adapted or matched to each other, rendering the union prolific and the progeny comparatively sound."

Dr. Voisin has recently published statistics which go to show that epileptic and idiotic children are no more likely to be descended from parents who were related to each other than from those not related to each other. He investigated the family histories of over 1,000 idiots and epileptics.

WHAT IS LIFE?

This question has been asked for ages, and has been variously answered.

Of the many theories of the ancients in regard to this subject I do not intend to speak.

Within the past few years some attempts have been made to solve the mystery of life by actual scientific investigation.

The facts and theories in regard to the CORRELATION AND CONSERVATION OF FORCES, that have been recently advanced by *Metcalfe*, *Count Rumford*, *Grove*, *Helmholtz*, *Mayer*, *Faraday*, *Liebig*, *Carpenter*, and others, have started a new method of investigating life.

According to the theory of the *Correlation and Conservation of Force*, "*light*, *heat*, *electricity*, *magnetism*, *motion*, and chemical affinity are all convertible material affections; assuming either as the cause, one of the others will be the effect. Thus *heat* may be said to *produce electricity*, electricity to produce *heat*; *magnetism* to produce electricity, electricity magnetism; and so of the rest. *We must humbly refer their causation to one omnipresent influence.*"

According to this view, *heat is but a mode of motion*. All these forces with which we are so familiar—light, heat, electricity, magnetism, motion, the vital force of plants, and the nervous force of man—are simply *modes of motion*. They are forms of energy or power. They are all mutually convertible. Mechanical motion may become changed into heat, or, into electricity. Electricity is now held to be a subtle motion of the molecules of matter. All of these changes may be reversed. Electricity, magnetism, and heat, as every one knows, can produce motion.

Count Rumford observed that when brass cannon were bored a great quantity of heat was produced. He afterwards found by experiment that in boring under water, the heat produced made the water boil in *two hours and thirty minutes*. Of this experiment Count Rumford says:—

"It would be difficult to describe the surprise and astonishment expressed in the countenance of the bystanders on seeing so large a quantity of water heated, and actually made to boil, without any fire."

"Just fifty years subsequently to the experiment of Rumford, (according to Prof. E. L. Youmans), Dr. J. P. Joule, of Manchester, England, after a most delicate and elaborate series of experiments, determined that 772 units of force produce one unit of heat; that is, 772 pounds falling through one foot produce sufficient heat to raise one pound of water 1° F. This law is known as the mechanical equivalent of heat."

The law is that a definite *quantity* of any one form produces a *definite* quantity of another. So much heat produces just so much electricity, or so much magnetism, or so much motion, and *vice versa.* If a boy kicks a football, the quantity of force that he uses is exactly represented in the motion given to the ball. If the ball rolls on the ground, the quantity of friction that it meets with is exactly represented in the amount of stoppage that it gives to the ball. A thousand familiar illustrations of this law will occur to every one who can comprehend this theory.

This leads us to the second part of this theory, namely, *that no force is ever annihilated.* Light passes into heat, heat passes into motion; electricity produces magnetism, and magnetism produces electricity; but amid all these changes no force is ever lost. The form or manifestation is changed, but the quantity remains the same through all time. Our house *is burned up, but it is not annihilated.* It passes away in the form of smoke, gases, and watery vapor and ashes. The larger the house, and the more combustible the material, the greater the quantity of smoke, or gases, or vapor, or ashes.

A plant or animal dies, but it is not annihilated. It passes into dust, and gases, and vapor; is resolved into its original chemical elements, or into something that represents them. Strictly speaking there is no such thing as death. Death of plants or of animals is simply a change of condition. Thus the teachings of religion and the conclusions of science beautifully harmonize.

The nervous force—the mind of man—is correlated to the other forces. Give to any man a definite quantity and quality of brain, and there will be a definite and corresponding quantity and quality of thought. On this subject I have spoken in more detail in the Physiology of the Brain.

This law of the Correlation and Conservation of Forces governs everything. It embraces the universe. It directs the movements of the stars, and holds in ordered activity the mighty procession of the firmament.

Prof. Huxley, in a recently published pamphlet entitled "*The Physical Basis of Life*," has advanced the startling idea that what is termed "Protoplasm" is the basis of all life in plants, in animals, and in men.

This protoplasm contains four elements—carbon, hydrogen, oxygen, and nitrogen—in very complex union. I quote as follows:—

"All work implies waste, and the work of life results, directly or indirectly, in the waste of protoplasm. Every word uttered by a speaker costs him some physical loss; and in the strictest sense, he burns that others may have light—so much eloquence, so much of his body resolved into carbonic acid, water, and urea. It is clear that this process of expenditure cannot go on forever. But, happily, the protoplasmic *peau de chagrin* differs from Balzac's in its capacity of being repaired, and brought back to its full size, after every exertion. For example, this present lecture, whatever its intellectual worth to you, has a certain physical value to me, which is, conceivably, expressible by the number of grains of protoplasm and other bodily substance wasted in maintaining my vital processes during its delivery. My *peau de chagrin* will be distinctly smaller at the end of the discourse than it was at the beginning. By and by I shall probably have recourse to the substance commonly called mutton, for the purpose of stretching it back to its original size. Now this mutton was once the living protoplasm, more or less modified, of another animal—a sheep. As I shall eat it, it is the same matter altered not only by death, but by exposure to sundry artificial operations in the process of cooking. But these changes, whatever be their extent, have not rendered it incompetent to resume its old functions as matter of life. A singular inward laboratory, which I possess, will dissolve a certain portion of the modified protoplasm, the solution so formed will pass into my veins; and the subtle influences to which it will then be subjected will convert the dead protoplasm into living protoplasm, and transubstantiate sheep into man. Nor is this all. If digestion were a thing to be trifled with, I might sup upon lobster, and the matter of life of the crustacean would undergo the same wonderful metamorphosis into humanity. And were I to return to my own place by sea, and undergo shipwreck, the crustacea might, and probably would, return the compliment, and demonstrate our common nature by turning my protoplasm into living lobster. Or, if nothing better were to be had, I might supply my wants with mere bread, and I should find the protoplasm of the wheat plant to be convertible into man, with no more trouble than that of the sheep, and with far less, I fancy, than that of the lobster. Hence, it appears to be a matter of no great moment what animal or what plant I lay under contribution for protoplasm, and the fact speaks volumes for the general identity of that substance in all living beings. I share this catholicity of assimilation with other animals, all of which, so far as we know, could thrive equally well on the protoplasm of any of their fellows, or of any plant; but here the assimilative powers of the animal world cease."

SCHOOLS AND SYSTEMS OF MEDICINE.

Medicine, like theology, has been divided into numerous sects or schools. The schools of medicine, like the sects of theology, have multiplied with the advance of civilization. The reason of this is quite apparent. In barbarous and semi-civilized countries there is comparatively little thought or *liberty* of thought. Even those who have a talent for thinking, inventing, discovering, pioneering, are kept down by the tyranny of law or custom, and dare not advance new views. The consequence is that in all such countries there is apt to be a uniform faith in medical science as in religion, to which all without question give allegiance. Even in enlightened Europe and America, liberty of thought is a plant of very recent growth.

Even the last quarter of a century has witnessed angry persecutions for scientific or religious opinion in the most enlightened portions of the globe, and on both sides of the Atlantic.

Political liberty, religious liberty, literary liberty, scientific liberty, all are children of our modern civilization, but of these political liberty was the first-born. Scientific liberty is the youngest child of all, and it is now in its infancy. Within my own memory some of the noblest benefactors of science have been derided and persecuted for holding and advancing different scientific views from those which were generally received by their neighbors. Some of the most honored leaders of scientific thought of our time—names that are known and loved in both hemispheres—have fought their way to success inch by inch, against opposition that would have crushed men of merely ordinary power.

I believe that very much and very valuable scientific truth has been lost to the world because its discoverers dared not risk their lives or their reputations by revealing their treasures.

On the other hand, as humanity progresses, as men become more thoughtful and more liberal, sects and schools multiply. It is as impossible for all men to think alike on matters of opinion, as it is for all men to be born alike. So long as men are born with different capacities and tastes, just so long will they think differently on all matters of opinion, provided they have the liberty of so doing.

There are certain facts in science which are demonstrated, concerning which there can be no difference of opinion among intelligent men; but there is much in science, and very much in practical science, especially in therapeutics, or the cure of disease, that can never be absolutely settled, that must remain a matter of opinion.

Accordingly we find that ever since men have enjoyed the luxury of thinking and talking as they pleased on matters of science, schools in medicine have multiplied with great rapidity.

They have particularly flourished in America, because this is a land of liberty.

These "schools" or "pathies" have received various names, some of them given to them by their friends and others by their enemies.

Among these names I may mention "*Old School*," "*New School*," "*Eclectics*," "*Alloputhists*," "*Homœopathists*," "*Hydropathists*," "*Thompsonians*," "*Electricians*," "*Mesmerizers*," "*Rubbers*," "*Kneaders*," "*Pounders*."

In regard to all these systems of treatment, I may remark:

1. *Many of them—I will not say all—have some basis of truth.* It is true that water is a most excellent remedy, and all wise physicians of our day use and recommend it. It is true that small doses of medicine are oftentimes less injurious and more beneficial than large doses, and all wise physicians of our day act accordingly. It is true that "herbs" are sometimes more efficacious than minerals, and all wise physicians of our day recommend and use herbs whenever they may be indicated. It is true that there is healing virtue of the most wonderful character in electricity; in animal magnetism, so-called; in the muscular exercise that comes from systematic rubbing, kneading, and pounding; and the wise physicians of our day are beginning to avail themselves of the advantages of these methods of treatment. Again, it is just as true that the minerals, the large doses, the purging, and the bleeding, and the blistering of what is commonly called the "Old School," are sometimes of service in the treatment of certain diseases; and the wise physician of our time does not hesitate to use even these unpopular methods of treatment in those cases

where they offer a better chance of helping the patient than any other known methods.

2. *All of these systems have suffered from the extreme views and practices of their disciples.*

It is *not* true that water is a specific for all diseases; and no wise physician believes that it is, or confines himself to that method of treatment for all diseases. It is *not* true that minute or small doses of medicine are always or usually more efficacious than large doses, and no wise physician of any school restricts himself to such a system of medication. It is not true that "herbs" are generally more potent than minerals, or that they are necessarily less injurious than minerals; *for the most terrible poisons in the world are vegetable poisons*, and no wise physician confines himself to treatment by herbs alone.

It is *not* true that electricity—mighty an agent as it is—will cure every disease from which the world suffers, and no wise physician uses it to the exclusion of other remedies.

It is *not* true that *rubbing, kneading, and pounding* will renew the youth or cure incurable maladies; and no wise physician recommends them indiscriminately for everything.

Again, it is *not* true that minerals, active purging, blistering, and bleeding are called for in all or even in the majority of the diseases of our time; and no wise physician, who appreciates and understands the change that has taken place in the types of diseases, and the wonderful advance that has been made in their treatment, now uses these so-called *heroic* methods as much as was formerly the custom even of our leading practitioners.

3. *Most of these schools, in spite of the errors and extremes, and even crimes, of their followers, have been of more or less service to the cause of medical science.*

Opposition, discussion, and quarrels arouse the mind to unwonted activity, and make us at once more energetic and more cautious. With all their errors, blunderings, enmities, despisings, backbitings, narrowness, prejudices, and ignorance, the different schools have aided the general cause of medical science, oftentimes unconsciously to themselves.

The world is even now crowded with empirics, charlatans, and with narrow, prejudiced, ignorant pretenders to science; and yet, in spite of all, medical science has progressed and progresses very rapidly. In spite of all, or by means of all, diseases are now treated much more successfully than formerly. Patients suffer less, and live longer. Many chronic diseases especially, that were formerly neglected, are now relieved and cured. For some of this progress our educated physicians, our leaders in science, are indebted to their enemies as well as to their own efforts.

4. *Patients make a serious mistake who desert a wise and judicious and advanced physician for any special "sect," or "school," or "pathy," or "ism," as such.*

I have known families who have deserted well-tried and upright physicians, men of science, ability, and experience, for vastly inferior and utterly unprincipled men of some special school or ism. Patients who act thus do great wrong to themselves, but still greater wrong to others. They do wrong to other patients who, by them, are influenced to commit a similar mistake.

I have known intelligent, conscientious, liberally educated men and women who have deserted their family physician in this way, under the mistaken notion that some special sect can have a panacea for all diseases. The ignorance of society on this subject is most fearful.

The simple truth is, that the science of healing disease is not, and in the nature of things never can be a mathematical science, and is chiefly made up of experience. *Happy hits* are sometimes made by special pathies or isms, and will be until the end of time; *but in the long run the best results, the surest cures, are made by the intelligent, upright, educated, liberal-minded physician, who judiciously avails himself of all means for the treatment of disease that experience has demonstrated to be useful.*

Patients should know the fact—which among physicians is well understood—*that in all these special schools, which are so rife today, their really intelligent followers do not confine themselves to the theories on which their systems profess to be founded, and only adopt the name as a matter of policy.*

I admit that in all these modern schools there are even yet to be found men so narrow, so ignorant, or so criminally prejudiced as to believe implicitly that the science of medicine must live and die with the special theories on which they found their practice.

Of late years great use has been made of the word "*eclectic*," and many have been charmed and misled by it. I say nothing for and nothing against the eclectic school, when I assert that every physician of our day who is worthy of his profession is in the true sense of the word *eclectic.*

The terms "old school," "allopathic," &c., are of modern growth entirely. They have never been adopted by any respectable body of physicians anywhere, but have been used by the people mostly to designate those who *are not* homœopathists, or hydropathists, or "Thompsonians," or of some other special sect. It is sufficient to say that these terms—allopathists, "old school," &c.—entirely misrepresent the character of the great majority of the really liberal, progressive physicians to whom they are applied.

SURGICAL ACCIDENTS AND EMERGENCIES.

THE IMPORTANCE OF SOME SURGICAL KNOWLEDGE TO EVERY PERSON.

THE following directions are not designed to induce the public to usurp the province of the regular surgeon, but merely to put our readers in possession of a few broad principles, and a certain portion of the modes of operation, by which they can calmly face the danger of an accident that involves the question of life or death in a fellow-being, *grapple with it until the arrival of a surgeon, and, when life can be preserved, to preserve it!* No family is proof against accidents. You may, perhaps, be called on, almost at any instant, to listen to the painful intelligence that a calamity of a threatening nature has happened to a member of your own household. Suppose such an one to have severed the main artery of the thigh—an accident entailing certain death, unless aid be immediately rendered—and no surgeon within some miles. The blood is gushing out in torrents from the wound, or he is already at the point of exhaustion! You would go calmly and scientifically to his relief, quiet the tumultuous grief of his surrounding friends, while dexterously applying a bandage which you would instantly construct of your pocket-handkerchief, and coolly put aside the arm of death!

There are accidents of a very common character which require surgical assistance, but which do not threaten life; such, for example, are fractures and dislocations. But even here assistance cannot be obtained too soon; for after the utmost and permanent contraction of the surrounding muscles, which generally takes place in about three-quarters or even half an hour, the reduction is effected with the extremest difficulty, and with inconceivable suffering to the patient; while, accomplished in the first moments after the accident, the adjustment of the displaced parts is comparatively easy, and is accompanied with very little pain. In short, the surgical cases of which we treat are those in which relief may be administered in the first moments, which are the most precious; and that, too, with as much facility, and with as much efficacy, in almost every instance, as if a surgeon were actually present.

Sea-captains are obliged to know something of surgery. What I shall hereafter say concerning fractures and dislocations will be designed chiefly for them, and for those who like them are liable *to meet with serious accidents in places where no physician can be procured.*

OF THE MEANS OF ARRESTING A FLOW OF BLOOD.

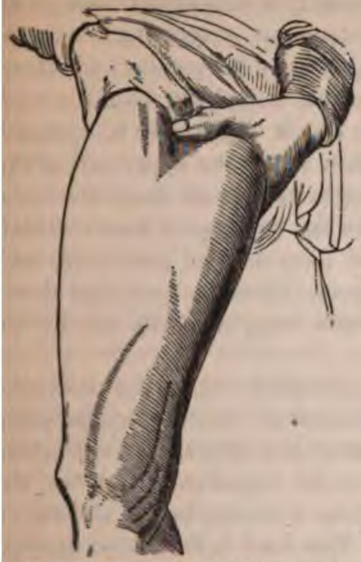
Whenever an accident occurs, wherein the loss of blood is liable to expose the wounded person more or less immediately to danger, the hemorrhage, or flow of blood, may be always suspended by *applying one or more fingers, according to the extent of the injury, upon the place whence the blood issues, while the other more important means are being prepared.*

These consist of any soft substances which are capable of being rolled up or moulded into the form of a plug, and are to be applied directly upon the open vessel, so as completely to fill up and cover the wound; for this purpose recourse may be had to sponge, German tinder, puff-ball, spiders' web, moistened paper, tow, lint, old and soft linen, wool, or, if in the country, and at a distance from any habitation, even fine moss. But whenever it can be obtained, the preference should be given to sponge, as it can be more easily insinuated into the wound, the interstices of which it fills completely up, by reason of its peculiar structure and its elasticity.

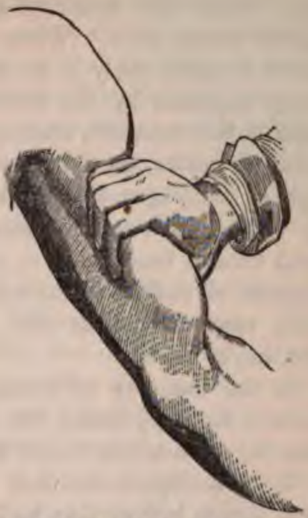
But in order to impart the greatest efficacy to the means just recommended, the clots of blood, if there are any, should be removed, and the wound washed with cold water, in order that the place from which the blood issues may be exposed as completely as possible; the point of the plug ought then to be placed directly upon the vessel, and not upon the clot. The cleansing of the wound alone will often cause the flowing of the blood to cease. The substances thus wedged in should be maintained in their situation by a neckerchief or a pocket-handkerchief, folded in the form of a cravat, a common band, or even a garter. If the means already pointed out should be insufficient to suspend the flow of blood, the whole application should be removed, and the pressure of the finger alone relied upon, until the surgeon, or a person acquainted with the nature and treatment of such accidents, can be called in. The wounded person could manage this himself in case of need.

The pressure of the fingers upon the same place during several hours would suffice to arrest the most considerable hemorrhage; but as this continued pressing, if confided to one person, would become too painful to be long endured, two or three persons should be employed to aid alternately.

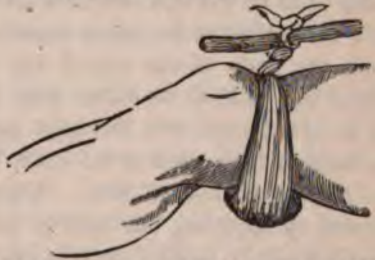
If, however, it should be found necessary, from the great depth or extent of the wound, to have the powers of restraining the hemor-



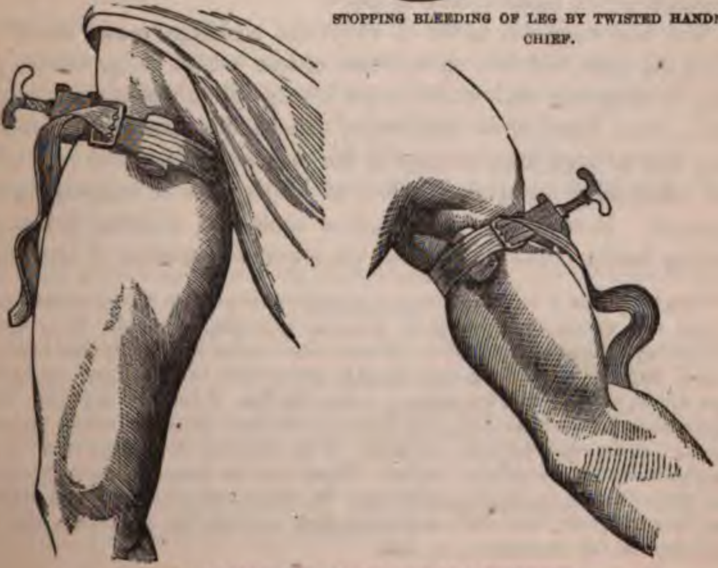
COMPRESSING ARTERY OF LEG TO STOP BLEEDING.



COMPRESSING THE ARTERY OF ARM TO STOP BLEEDING.



STOPPING BLEEDING OF LEG BY TWISTED HANDKERCHIEF.



STOPPING BLEEDING BY APPLICATION OF A TOURNIQUET.

rhage under still more complete control, a tourniquet should be applied to the limb. When this instrument cannot be obtained, (which is most likely to be the case,) it may be readily and efficaciously replaced by the following means, namely, a handkerchief folded in the form of a cravat, to each end of which is to be fastened a band or garter, should be bound tightly round the upper part of the thigh or arm, care being taken to apply previously along the inner side of the limb, immediately beneath the bandage, a handkerchief folded several times over, or a piece of linen doubled backwards and forwards of sufficient thickness to press upon the principal vessel which runs along this part, and which may be easily felt by its pulsation or beats.

In the majority of cases, and particularly when the wounded person is not very fleshy, the above method of exerting compression upon the main artery would alone suffice; but otherwise, a substitute for the tourniquet, not less simple, more expeditive, and, on the whole, much better, may be formed from a cravat, in the middle of which is to be made a double knot. This knot is then to be applied upon the course of the main vessel which it is necessary to compress, while the ends of the cravat are carried, one before and the other behind the limb, to its outer side, from whence, after crossing, they are to be returned over the knot and effectually secured, either upon the front or back part of the limb, by means of pins, or on the opposite side by a knot or bow. A powerful compression may be also effected by applying the ends of the fingers upon the part where the pulsation of the main artery is felt.[*]

The best means is to tie or twist the bleeding vessel itself just above the part which is open,—the course which is generally pursued by surgeons, and which is not a very difficult thing to perform; but if, from timidity or otherwise, this be not practicable, nothing more can be done than to employ the means just pointed out, which will effectually suspend the flow of blood, until a surgeon can be procured. It may not be altogether useless to observe, before proceeding further, that when, after the common operation of bleeding in the arm, and the surgeon has left the patient, the blood should gush out afresh,—which not unusually happens—the bandage should be removed from the arm, the wound washed, a fresh pledget placed upon the orifice, and the ligature re-applied in a similar manner; that is to say, in the form of the figure eight, the inter-crossing of it being of course made to correspond to the pledget; the patient should then be told to keep the arm quite still, and in a half bent position. Sometimes a completely bent position will, of itself, suffice to arrest the flow of blood.

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[*] The tourniquet is used to produce so powerful a compression upon a severed artery, or upon any wound accompanied by alarming hemorrhage, that the blood shall be restrained by mere mechanical force. A very simple means of effecting this object is as follows. Suppose, for example, that the large artery of the thigh has been cut, by which death will be produced in a few minutes, unless the flow of blood be stopped. Take a common pocket-handkerchief, and pass it around the thigh above the wound, previously inserting a strong stick between the outside of the limb and the handkerchief. Let the latter be drawn tight, and firmly knotted. Then turn the stick, which will operate as a lever, and will make the bandage press upon the artery with almost any force desirable. Many lives have been lost which might have been saved by this application, and which almost any one can command at any time.

Leech bites, especially in children and very delicate individuals, will often give rise to a loss of blood difficult to suppress. If the means ordinarily employed, fail to effect the desired end, recourse may be had to the following methods. The skin is to be gently pinched up, about the spot where the blood is flowing freely, and the part itself covered with finely powdered charcoal or powdered alum, or, better still, a morsel of sponge or lint soaked with a spirituous liquor. Surgeons sometimes employ a small needle, which is run through the cuticle, or outer skin, immediately above the orifice; this is instantly and effectually closed, and the flow of blood quickly suspended.

A most essential thing to be observed is, to keep the wounded person perfectly quiet, in order that whatever may have been applied, may not become displaced. He should never be lost sight of, in order that if the hemorrhage return, instant assistance may be offered him; but unless such a circumstance take place, nothing should be touched, for fear of the slighest alteration occasioning the closed vessel to re-open. Attention, however, should be paid to the bandage, so that if it should be found at all loose it may be gently tightened; or that if on the contrary, it should prove too tight, so as to occasion pain or swelling of the parts, it may be relaxed. *In no case should any exciting food or drink be given to the patient; he should be allowed but little aliment, and the use for drink of nothing but pure water.*

ON THE FIRST ASSISTANCE TO BE RENDERED IN CASES OF DANGEROUS ACCIDENTS.

In the event of a fall, or of a severe blow, or of any considerable violence which may have given rise to accidents of a serious character, or at least to those which are supposed to be so, every thing depends, in most instances, upon the *first attentions* afforded to the injured person; their aim should be to relieve his sufferings, and facilitate his re-establishment. On some occasions they will even recall life and preserve his existence.

But before proceeding upon what ought to be done, a few remarks may be offered upon what is essential to be avoided.

1st. On no account let beer, wine, ardent spirits, or spirits and water be given him in the mistaken view of reviving him, of doing him good, or affording him strength. It is exceedingly rare that such means are useful; and in the vast majority of cases they are positively injurious, not to say highly dangerous. Pure water alone, if he asks for drink, should be offered him.

2d. The patient should not be surrounded by a number of persons, for fear that, in the disorder and confusion inseparable from a crowd, his case may be aggravated, some fatal movement be occasioned, or some misunderstanding arise about what should be done or what given, while the employment of things which are really useful may be neglected or prevented. Two or three persons are quite sufficient to be about him; and more particularly if the chamber be small and close, and the weather warm.

3d. The greatest caution should be used, that he be not shaken or inconsiderately removed before it has been ascertained whether such removal would not be injurious, or, at least, whether it would not be preferable to tender him the attentions his situation requires on the spot, in allowing him to remain quiet. The first thing to be done is to place him in a good position; one that will enable him to breathe freely; his nose and mouth should be cleared of any dirt or blood that might impede respiration; his limbs also should be placed in a favorable direction, in order that if there should exist a fracture, this might be less menacing by being less complicated; his dress should be attended to in order that nothing tight should press about his neck, body or limbs. An examination must be made to ascertain if there is any loss of blood, and from whence this hemorrhage arises, to the end that if it be considerable it may be restrained by the means which we have previously indicated. If not considerable, the flow of blood should not be suppressed, but encouraged by the use of a sponge and warm water, for it is well known that blood-letting is generally necessary in cases of this character, as it tends to ward off the most serious consequences of an injury, and that therefore a moderate loss of blood advantageously replaces that which on other occasions must be drawn by leeches or the lancet. When these first cares have been devoted to the sufferer, the good sense of his attendants will teach them not to expose him to the cold, to an undue degree of heat, or to the wet, as also to call in immediately a surgeon. But in very grave cases it would be advisable to send for the two nearest; for the presence of both would not be too much unde such circumstances, while, on the other hand, there would be an extra chance in favor of enlightened aid.

If the protracted absence of the medical men, or the great distance from their dwellings, should give rise to serious apprehensions for the safety of the sufferer, no hesitation should be made in sending for a good nurse, or some one who may have had an opportunity of frequently witnessing cases of accident, and the usual methods of treatment of such cases; and then, perhaps, it would be advisable, after taking off, as well as can be done, the patient's dress, to apply leeches, fomentations, or emollient poultices upon the seat of the injury, which is generally swollen and painful. But as these means, especially the two first, are not always easy, nor always requisite, it will be enough, in the first instance, to have recourse to cold water constantly applied to the seat of the injuries by means of soft rags upon the cut, lacerated, or contused parts.

Water, simple as it may appear as an application, is, in the opinion of the greatest surgeons of all nations, the very best of remedies, and renders totally superfluous the application of the balsams, ointments, and other external remedies which are ordinarily employed. Some persons are led to expect a miraculous good from the addition of certain articles to the water, but let them rest assured, that so far from increasing its efficacy, they are far more likely to render it irritating and injurious.

Let attention be paid to the temperature of the chamber, that it be neither too warm nor too cold, and that there be no more persons present than are absolutely necessary to the duties required by the situation of the sufferer. The occasional visit of a friend, which is always better avoided, should be of short duration, and more particularly if it should appear to cause much excitement to the patient, or to trouble him.

On no account should heating liquids be administered; a little lemon whey, or better still, lemonade or barley water, should be preferred; nothing should be given to the patient to eat; (the strictest abstinence is *rigorously* to be observed and persisted in for the first few days;) the bowels are to be gently opened by means of injections; (an ounce or an ounce and a half of salts in a little thin gruel;) and the wet rags frequently changed, attention being paid to those which are saturated with blood, for the reasons already mentioned. A good nurse will always preserve her presence of mind, and that calm which is so necessary to assure the patient. She will endeavor by all means to restrain the sobbings and lamentations of assistants, and, in short, babbling and noise of all kinds, which not only tend to fatigue the patient, but to trouble that repose of body and mind of which he stands so eminently in need.

In circumstances such as these, and when there exists genera and very serious contusions, a warm bath is particularly recommendable; and where it is possible to procure one, it is advisable to keep the patient in it an hour or more. But when this is difficult to obtain, or when it would be necessary to wait a considerable time, a sheet, or what is still better, a blanket, soaked in warm water, and frequently renewed, may be advantageously substituted for it.

It is the same with the freezing body as with fruits when nipped by the frost, and which become almost immediately rotten, if care be not taken to thaw them first in cold water; and experience, moreover, teaches us the suffering we expose ourselves to, when being extremely cold we approach our hands too near the stove. If the individual's feet who has received an injury are extremely cold, hot flannels may be applied to them, or otherwise a bottle of hot water. A cup of tea may be administered, or a little gruel, to which may be added two or three table-spoonsful of wine, or a tea-spoonful or two of spirits. If he should have been in liquor, or should have the stomach overcharged with food, vomiting should be excited by tickling the fauces or back part of the mouth with a feather. This operation, or rather the evacuation which results from it, is of the highest utility, and prevents, or at all events calms, many very bad symptoms.

If the individual is insensible, and if the means just pointed out fail to recover him, or if from the exhaustion and debility occasioned by the loss of blood he is in a fainting state, means should be employed to re-animate him, such as are usual in similar states arising from ordinary causes; namely, the application of hot flannels on the pit of the stomach; rubbing the limbs with a brush or a hard towel; strong vinegar or spirits applied to the mouth, to the temples, or introduced into the nostrils by means of a feather; a clyster (or injection to the bowels) composed of one half water and the other half vinegar; sudden aspersions of cold water upon the face or the region of the heart, taking care afterwards to rub the parts dry with hot towels; in short, by currents of fresh air. But the best and most energetic of all these means is, without contradiction, *boiling water* To use this conveniently and effectually, it must be brought alongside the patient, and a metallic body plunged into it, which is then to be carried alternately and in the following manner over the different parts about to be pointed out.

The bowl of a spoon or a hammer are as good as any thing for this purpose, and are extremely convenient. The instrument must be plunged into boiling water, and placed with rapidity upon the sole of one of the feet. After some instants it must be applied to the sole of the other foot; then successively upon the neck, the pit of the stomach, the calves, along the spine of the back, and upon various parts of the head; the application being pursued in this manner until the patient returns to himself, or until the surgeon arrives, who will prescribe other remedies.

The application of the hot iron need rarely be continued beyond one second upon each particular part; that is to say, it should be made to touch the skin but lightly; although in some serious cases it will be found necessary to allow the instrument to remain somewhat longer in contact with the part which it is considered necessary to irritate, in order that a stronger and more lasting impression may be produced.

Should there exist reasons for managing with still more control the delicate susceptibility of the patient, a sheet of paper or a morsel of linen rag may be interposed between the skin and the instrument; but then the latter must be more frequently applied, and allowed to remain longer upon the part.

The very slight and circumscribed burns thus occasioned, of an inch or an inch and a half in extent, are in no respect dangerous, and are unattended with any inconvenience; but, renewed with sufficient frequency, they offer the most powerful agent medicine possesses for awakening sensibility, and reviving the spark of life about to become extinguished.

With this view it is that the method just described is recommended, it being a means so simple and so much within the reach of ordinary persons; it is one which imitates, in short, the happy and salutary effect of mustard poultices, blisters, and the moxa; while it is unattended by the unpleasantness of all those applications.

The moxa is the application of a burning substance to the surface of the body, to act as a counter-irritant in a variety of diseases. The operation for the moxa is usually performed thus:—A piece of German tinder, of the size of a shilling, is dipped in camphorated spirits of wine, and, after being inflamed at a candle, is held, by means of an instrument, in contact with the skin, which becomes burnt, and afterwards forms an eschar.

OF THE FIRST ATTENTIONS GENERALLY REQUIRED BY WOUNDS.

The first thing to be done is to wash or gently cleanse the wounds which may happen to be covered with earth, clots of blood, or other foreign bodies. If the blood flows abundantly or disagreeably the hemorrhage may be stopped by the means already mentioned; and in general it suffices to apply upon the injured part a bit of soft linen, moistened with cold water, and maintained in place by a handkerchief. Should the wound be produced by a slug or ball, or should it be lacerated and considerably contused, nothing remains to be done but to sprinkle the dressing from time to time with cold water.

This is all that it would be necessary to do, if it should be a case of burn.

But if it should be a cut or incised wound, whether from a sabre, hatchet, knife, scythe, or other cutting instrument, there is this precaution always to be taken; namely, to bring into exact contact the edges of the wound, in order that they may unite, and the cure be accelerated. As to the after treatment, it is strictly the affair of a regular surgeon, but every one may be taught to imitate it, by placing the injured limb in such a position that the wound gape as little as possible. The good sense of the attendants, and some little instruction, will suffice to put each in a condition to effect this important object. Thus, the fingers and hand must be closed as when the fist is clenched, if the wound be within, and kept maintained in that position; if, on the contrary, the wound be on the opposite side, the hand must be kept upon the stretch. If the wound be on the bend of the knee or of the elbow, the leg or arm must be bent; or, on the contrary, extended, if it occur upon the knee or elbow themselves.

When the wound is on the neck, the head must be brought to incline toward the side upon which the wound exists.

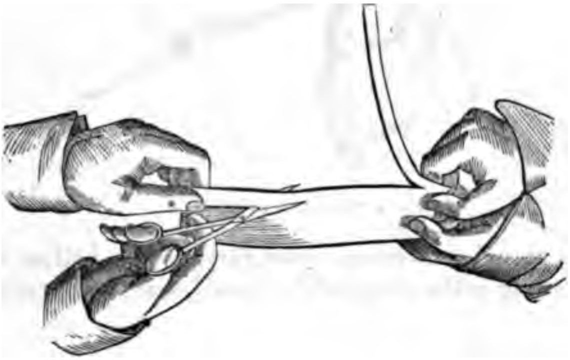
As a general rule, that position is to be sought for, which will diminish to the greatest degree the extent of the wound, and must be maintained in the best manner possible, after the edges have been brought with great exactitude together.

Such will be the object of the surgeon upon his arrival; but before his presence can be procured, and there is no possibility of constructing the appropriate bandage, the hands of an attendant should be made to supply its deficiency. It is more especially when wounds occur in the neighborhood of the joints, or when they are accompanied by a division of the bones or sinews, (tendons,) that the edges of the wound should be immediately brought into contact, and maintained so by the means just recommended.

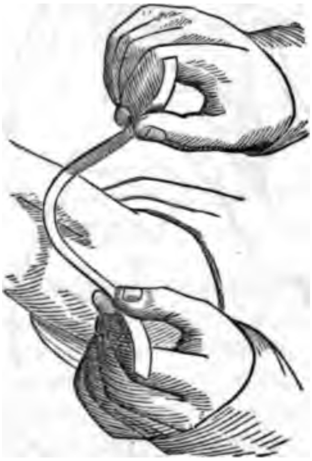
What has been already said of the regimen to be imposed on the patient, and of those attentions which wounds in general demand, is not less applicable to the injuries lastly spoken of, and must be rigorously observed.

Every family ought to be in possession of a large piece of adhesive plaster; as to linen rag, it will in general be readily found. The general directions given above for the first attentions to be bestowed upon a wound, suffice for every case; as to the application of the dressings, the following rules will be found equally to hold good.

There are circumstances in which surgical aid cannot be procured. In such cases persons should be able to conduct the after-treatment throughout. We will suppose a common incised wound, from a sharp instrument, in which no large vessel is implicated. The first thing to be done is to cleanse it. The next is to cut a number of strips of adhesive plaster, and prepare some soft linen rag for compresses or pledgets. When these have been prepared, the muscles of the injured parts must be brought into relaxation, the edges of the

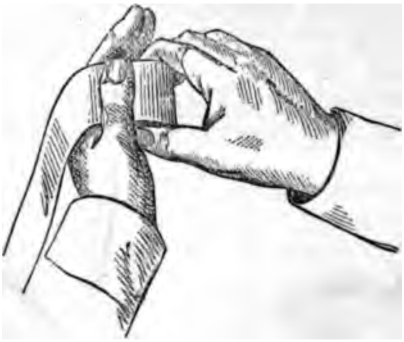


CUTTING ADHESIVE STRIPS.



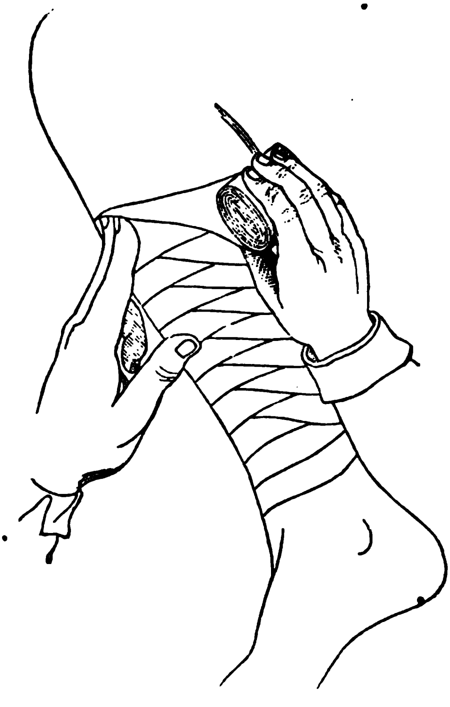
APPLYING ADHESIVE STRIPS TO WOUNDS.

wound brought into contact, and strips of adhesive plaster, previously warmed, applied so as effectually to maintain them thus. These strips



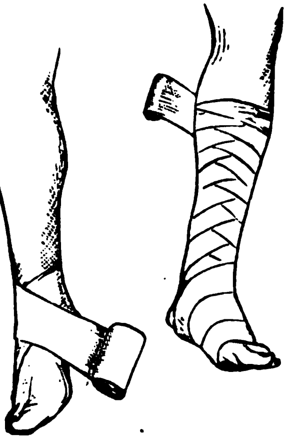
ROLLING A BANDAGE.

should be placed at distances apart, varying from half an inch to an inch, according to the extent of the wound, so as to allow of the exuda-

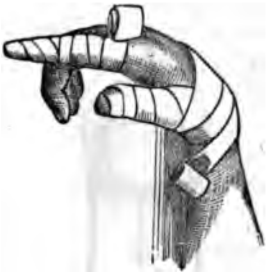


BANDAGING THE LEG.

tion of fluids in the progress of the cure. A light compress or pledget should then be laid over the injury, and a bandage applied to keep the whole in place, and support the action of the sticking plaster. *The bandage may always be constructed by means of a handkerchief, or a piece of linen of the same form, folded to suit the nature of the accident, or the part upon which it is to be applied.*

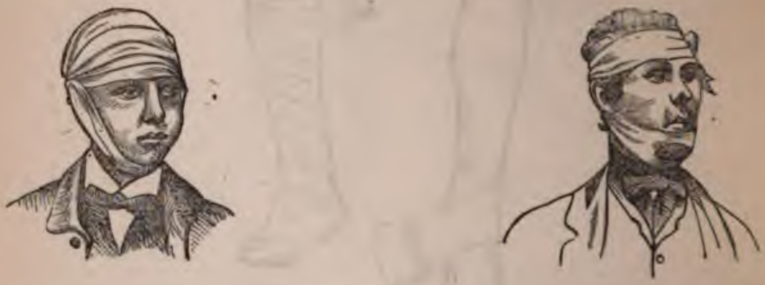


BANDAGING THE LEG.

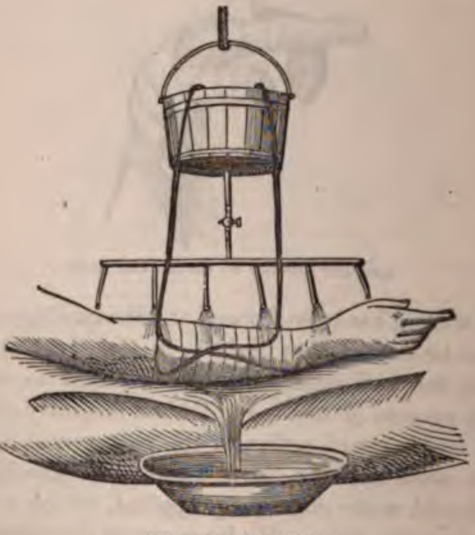


BANDAGE APPLIED TO FINGER AND HAND.

After the wound has been dressed and the bandage applied, which should always be done rather lightly, to guard against subsequent inflammation, the sufferer should be compelled to observe perfect repose. The process of healing will then instantly commence; but should there be too much action in the parts—that is to say, should inflammation arise and the parts swell—the bandage should be loosened and cold water constantly applied, which will soon restore the parts to a healthy state. Under common circumstances, the first dressing should remain until about the fourth day, when it is to be changed in the following manner. 1st. The *bandage* is carefully to be lifted off. 2dly. The *compresses*, which generally adhere, and require the application for some time of warm water to detach them easily. 3dly. The *plasters*, the ends of which should be first lifted up; and then the person officiating, seizing them with his right hand (while with the left he presses gently the thumb on one and the fingers on the other side of the wound, to prevent the uniting edges from being at all disturbed), raises them perpendicularly, but slowly and gradually, never acting upon more than one plaster at a time. The wound ought then to be gently sponged with warm water, and a fresh dressing applied in the way already stated.



BANDAGES FOR HEAD.



IRRIGATING A WOUND.

Although strapping be not *rigorously* required in wounds of this character (the bandage sufficing in a great majority of instances, with a compress on each side of the wound), yet it is unquestionably the most secure method, and particularly in hands not often accustomed to treat such accidents.

Torn or lacerated wounds demand nearly the same treatment, but the dressings require to be put on with the utmost gentleness, and the bandage applied still more lightly. When inflammation comes on the wounded limb may be cooled by water, in the manner represented in the cut.

OF FRACTURES.

Although the bones are almost insensible to pain when in a sound state, yet when they are fractured the slightest motion of the fractured extremities is attended with acute suffering. This has the effect of securing repose and quietude, without which the process of recovery would be prevented, and an exact reunion of the broken part could not be accomplished. The irritation produced has also the effect of exciting the healthy action of the nutritive vessels of the part, causing them to pour out the soft substance technically called *callus*, which, when fractured parts are in an exact state of adaptation, glues them, as it were, together. This union in the course of a few weeks is consolidated, and the limb is again fitted for the performance of its functions. In ordinary cases of fracture, nature sets up no greater action than is necessary for the reparation of the injury; if the bones be properly set, and kept in their natural position by the judicious use of splints and bandages, the limb being retained in a suitable posture, little or no pain or inflammation will occur. We shall now proceed to notice the methods of treating the fractures which are of the most frequent occurrence.

Simple fractures may be easily cured by any one possessed of common sense and a gentle hand. Yet from ignorance of a few simple rules, the patient's friends are often unable to afford him any relief, the future usefulness of the limb is impaired, and permanent deformity is frequently the result. In more complicated cases, where the bones are crushed, and the soft parts bruised and lacerated, or the fractured extremities of the bones protrude through the skin, all the skill of the experienced surgeon is required to restore the injured parts. Yet the following hints, for the management of simple fractures, may be of service when the aid of the surgeon cannot be obtained.

FRACTURES OF THE THIGH-BONE.

The bone is generally broken about the middle, or towards the lower extremity; the fracture is often transverse, but more frequently oblique.

The patient experiences severe pain at the moment of the accident, and is unable to move the limb; the foot is turned outwards from the weight of the limb; and the thigh is more or less shortened, according to the degree of obliquity of the fracture, the lower end of the bone being almost invariably drawn behind the upper one, which remains stationary; thus the ends of the fracture ride over each other. If the bone be broken directly across, there can be no shortening of the limb, unless the upper end of the fracture ride over the lower, which rarely happens.

Dr. H. G. Davis states, in his work "Conservative Surgery," that in case of fracture, in moving the patient, or, if he has fallen, in taking him up, "continued extension" should be applied, that is, a continuous pulling; this can be done with the hands. This pulling prevents the rough ends of the bone fractured from piercing into and wounding the soft parts; it also prevents pain.

The first thing to be done is to prepare a long splint, which may be made of a piece of firm deal-board, of a degree of thickness sufficient to prevent it from being bent, or easily broken. It must be long enough to extend from a little above the false ribs to three or four inches beyond the sole of the foot, and should decline gradually in breadth, so that the breadth shall correspond to the dimensions of the limb. At the lower end two deep notches are to be made for the attachment of the bandages, and the upper end is to be perforated by two holes, for the same purpose. The patient having been placed on a smooth and firm bed (a hair mattress is generally preferred), his limb is to be covered with a common bandage or roller, from the toes to near the knee. This is done merely to prevent the leg from swelling, which would otherwise happen from the pressure that must necessarily be made higher up. The operator should now gradually draw out the fractured member, while an assistant keeps the upper part of the thigh firmly fixed until the limb is of the same length and direction with the sound one. The long splint, well padded with proper cushions, in order to prevent the skin from being injured, is then to be applied, and attached to the limb by means of a roller, which is to be passed round both, from above the knee down to the foot, and having been turned round the ankle is to be passed through the notches, so as to be firmly fastened to the end of the splint; the foot is thus effectually prevented from changing its position. A broad bandage is now to be applied round the lower part of the body, so as to fix the upper extremity of the splint, thence down over the groin, and continued downwards, still involving both the limb and splint, until it reach the bandage first applied. The splint being now firmly attached along the whole length of the limb, we are next to fasten a broad bandage round the lower part of the waist, in order to bind it to the trunk of the body. Next pass a handkerchief or shawl over the groin and buttock, and securing its ends through the holes at the top of the splint. By tightening the handkerchief, or whatever bandage may be employed, we of course extend the limb, and this must be done frequently, in order to preserve it of the proper length. It will be advisable to reapply the bandages twice or thrice in the course of the cure, which generally takes place in about six weeks; but the patient must be careful not to rest his whole weight upon the limb till three months have elapsed, because the osseous substance, by which the ends of the bones are united, is for a long time tender, and might be readily broken again. To prevent the skin from being injured, it will be necessary to pay particular attention in adjusting the cushions about the ancle and at the groin, where the bandage, which passes up between the thighs, must necessarily cause considerable pressure.

FRACTURES OF THE BONES OF THE LEG.

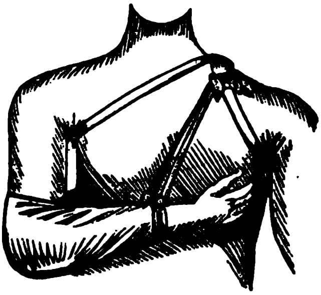
Sometimes the shin bone, or *tibia*, is fractured, while the fibula, which is situated behind and towards the outside of the leg, remains entire. When it occurs near the protuberance below the kneepan, the injury is readily recognized, particularly if the knee be bent, for then the upper part of the broken bone is thrust forwards. Roll a bandage round the limb from the toes upwards. Extend the leg. A splint of wood, hollowed to fit the limb, and long enough to reach from the middle of the thigh to near the heel, is to be placed behind, whilst a pasteboard splint is to be applied on each side. The whole are then to be secured in the usual way by means of a bandage. If the two side splints are of wood, they should be applied by means of a linen splint-wrapper a yard wide, and of sufficient length to cover the splints. The wrapper is to be placed underneath, and the splints rolled up in its longitudinal border, until they reach the limb; if they do not fit properly, we must roll them over again, until they come accurately in contact with the sides of the limb. Wherever two wooden splints are required they may be applied in this manner, which, though a little more troublesome, is decidedly the best. Five bands of tape, or strong linen, two fingers' breadth wide, placed under the lower splint, are now to be brought round and tied at the outer side of the limb; or a roller may be applied as above directed. Care must be taken to keep the heel sufficiently raised, by placing pads under it.

If the shin-bone be broken lower down, the patient loses all power of the limb, and the slightest movement causes great pain, but there is not much deformity. By moving the fingers along the front and sharp edge of the bone, which are only covered by skin, the seat of the fracture may be easily ascertained; or if we grasp both ends of the bone, and move them in opposite directions, the displacement of the pieces may be perceived, and we may also distinguish a grating noise. The treatment here consists in placing a pasteboard splint on the outside of the leg from a little above the knee to the ancle; and another on the inside of the same length, cushions having been interposed between the splints and the leg, to prevent the skin from being injured. The apparatus is then to be secured by five or six flat pieces of tape, which may be easily relaxed or tightened, according to the degree of swelling. The limb is to be placed upon its outer side, with the knee bent upon a pillow. If wooden splints are employed, they should be applied with the wrapper in the manner above described, and oaten chaff cushions or proper pads placed along the limb, to protect the skin.

When both the bones of the leg are broken together, they seldom give way opposite to each other. There may be a distance of several inches between the fractures. This injury causes the foot to be turned out, and the leg to be bent and deformed. The eighteen-tailed bandage, is generally employed in the treatment of this fracture; many surgeons use it in every case of fracture of the extremities. It is made as follows. To a piece of linen three or four inches wide, according to the size of the limb, and as long as the leg, are to be stitched crosswise eighteen strips of the same width, and in length sufficient to make a turn and a half round the limb, from the knee down to the ancle. They are to be stitched so as to cover each other for about two-thirds of their breadth. The lower ones do not require to be so long as the upper, and they should be attached rather obliquely to the middle piece, so as to allow them to fit properly round the limb. In setting the bones, the knee is to be slightly bent, and the leg drawn out so as to bring the ends of the bone in contact. The limb having been carefully raised, a splint extending from above the knee to beyond the ancle, covered with a soft pad, and having over this the eighteen-tailed bandage, is to be placed underneath; the leg is then to be gently lowered until it rests upon the apparatus. But in raising the limb from the bed, the operator must be careful to keep the upper and lower parts of the bone on the same level, by firmly grasping the limb above and below the fracture, and elevating them together, so that the fractured surfaces may be maintained in apposition. The eighteen-tailed bandage is now to be applied in the following manner. The operator lays hold of the extremity of the lowest band or tail, the opposite one being fixed by an assistant, and passes it obliquely across the leg to the opposite side; he then brings over the end held by the assistant with one hand, while with the other he retains the first firmly in its place, and applies it in the same manner round the limb so as to intersect the first. The tails are to be thus applied in succession from the ankle up to the knee. The ends should always be carried underneath the limb. Another pad of some soft substance is next to be applied over the upper part of the limb, and over that another splint of the same length as the first. Five or six pieces of flat tape or strong linen, which ought in the first instance to be placed under the lower splint, are now to be brought round and tied. The limb should be fixed upon a frame in the form of a double inclined plane, made by nailing the boards together at an obtuse angle, with the addition of a foot board. The splints are to be retained for five or six weeks, the time required for the union of the bones varying according to circumstances. After their removal, the limb should be accustomed to its former functions by degrees; and the patient should be careful not to put much weight upon it for at least two months.

FRACTURE OF THE COLLAR-BONE.

The fracture generally takes place about the middle of the bone and is easily detected, because we can feel the bone along its whole



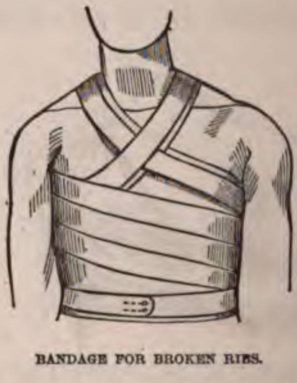
APPARATUS FOR BROKEN COLLAR-BONE.

length. The weight of the shoulder and arm makes the outward portion of the broken bone fall downwards and forwards along with the arm; and thus causes the shoulders to seem narrower, while the piece which is attached to the breast-bone appears raised, without really being so. To place the broken ends of the collar-bone in contact, both shoulders must be pulled strongly backwards, and kept in that position by turning an appropriate bandage round the shoulders. The arm being now placed across the chest, with the fingers pointing to the top of the opposite shoulder, is to be supported and fixed in that position by fastening a broad bandage round the arm and chest, or by rolling a firm pad made of soft material in a shawl, and placing it in the arm-pit, which it should be large enough to fill. The shawl is then to be tied over the opposite shoulder, and the ends brought down and secured at the arm-pit of the sound side; cushions or pads being interposed to prevent the knots from injuring the skin. The arm is to be supported and fixed as above directed. No splints or lotions are required, but the part should be examined occasionally, and the bandages adjusted so as to keep the ends of the bone accurately in contact.

It may be necessary to draw blood, and to keep the patient on spare diet for a few days.

FRACTURE OF THE RIBS.

The fracture unites readily, and the only danger to be dreaded is inflammation of the lining membrane of the chest, called the *pleura;* hence it is absolutely necessary to bleed the patient freely, if his countenance becomes anxious, his pulse quick and strong, the breathing short and hurried, with other symptoms indicating the



BANDAGE FOR BROKEN RIBS.

approach or commencement of pleurisy. When one or more ribs are fractured, the patient feels the broken surfaces grating on each other every time he attempts to take in a full inspiration; the ribs may also, in most cases, be felt working backwards and forwards under the fingers. This crepitating or grating movement cannot, however, be discovered in every case. The pain is sharp, and augmented by moving the trunk of the body, by coughing, sneezing, or attempting to take in a full breath. All that is necessary to be done for the cure of fractured ribs is to apply a broad belt or bandage round the chest, to prevent the ribs from being alternately raised and lowered during respiration, and the firmer it is applied the more relief the patient experiences. It is usual to pass a split cloth over the shoulders, which is to be fastened to the circular bandage, to prevent its being displaced. In general it is proper to draw blood from the patient soon after the accident, and to confine him to low diet for a few days.

FRACTURE OF THE ARM-BONE.

Fractures of the arms are quite frequent. They happen to little children, to adults, and to the aged. It is very important that they should be well managed, because the arms and hands are really more necessary for our comfort and existence than the lower limbs. A man with a broken arm is really more helpless in many respects than one whose leg is broken. Many who are paralyzed in their legs, and yet have the use of their arms, can follow some sedentary occupation, and thus support themselves and their families.

The fracture is sometimes oblique, but more commonly transverse; there is generally considerable displacement of the broken ends of the bone, and more or less shortening of the limb; the latter is sure to occur if the fracture be oblique; the arm hangs useless by the side, and the slightest movement of the limb causes the broken ends of the bone to grate against each other (*crepitation*); in fact, there can be no mistake about the nature of the accident. There is no difficulty in setting this fracture. The operator grasps the elbow with one hand, and gently extends the arm, while with the other he straightens the limb and replaces the bones. To secure the fractured parts in their situation, a splint of strong pasteboard is to be placed along the outside of the arm, from the top of the shoulder to a little way beyond the point of the elbow; and another splint of the same description is to be applied from the arm-pit to the elbow on the inside. The splints should be steeped in hot water, and padded with some soft substance, to prevent them from galling the skin. "The conjoined breadth of the splints," says Mr. Liston, "should be sufficient to embrace the limb almost entirely; some space being left, so that when the swelling subsides they may neither meet, and consequently lie loose, nor overlap each other. A long bandage or roller, is now to be applied over the whole, commencing from the fingers, and extending it as high as the shoulder. This must not, however, be applied so tight as to interrupt the circulation of the blood in the limb. A wooden splint should be placed on the outside, and another bandage applied; this, however, is only to be retained until the pasteboard splints dry, so as to form a sort of case for the arm. The elbow should be bent at a right angle, and the whole of the fore-arm properly supported in a sling. If pasteboard cannot be obtained, wooden splints may be substituted. On the seventh or eighth day, if the bandages have slackened from the subsidence of the swelling, the bandages must be removed, and one of the splints raised, to ascertain that there is no shortening of the limb, nor any displacement of the bones, and again carefully applied as before. If any deformity be observed it may easily be remedied, for the bones do not begin to unite before the seventh day from the date of the accident. In ordinary cases the bone will be firmly united in about a month; but the arm should not be used with much freedom before the expiration of six or seven weeks.

FRACTURES OF THE BONES OF THE FORE-ARM.

Of the bones of the fore-arm, the one called the *radius*, is more exposed to fractures than the other, called the *ulna*. Fracture of the radius is an accident of frequent occurrence. There is very little distortion unless the fracture takes place close to the wrist, and then there is considerable deformity. Whether the bone be broken high up towards the bend of the arm, or down near the wrist, the fracture may be easily ascertained by tracing the bone with the fingers. In all cases the patient experiences difficulty and pain in attempting to turn the arm round; and if we grasp the limb above and below the part where the pain is chiefly felt, and endeavor to move the hand in different directions, a grating noise will be heard, while a sensation is experienced by the patient in consequence of the motion, which convinces him of the nature of the accident.

When the radius is fractured, the ulna, or inner bone, serves as a splint on one side, while it effectually prevents shortening of the arm, and therefore renders extension unnecessary in setting the fracture. There is no difficulty in placing the ends of the bone in apposition, and retaining them in their situation. A pasteboard splint, which has been softened in hot water, is to be placed upon the outside of the arm, from a little above the elbow, to the tips of the fingers, soft pads being interposed between it and the arm. A similar splint is to be applied on the inside, from the bend of the arm to the end of the palm of the hand. A long bandage is then to be applied, to retain the splints in their places. The arm is to be placed in a sling, the palm of the hand being turned towards the breast. The patient must take care to keep the hand in this position, and the wrist steady; no attempt should be made to turn the palm up or down, because nothing tends more to displace the bones.

The ulna, or inner bone of the fore-arm, is not so often fractured as the radius; but is as easily set, and is kept in its place by means of two splints, with a bandage, as above directed.

Both the bones of the arm are sometimes broken; in this case the patient is unable to move the hand; there is much deformity and shortening of the limb, and considerable swelling soon follows the accident. In setting the bones, it is necessary to extend the arm until it is of the proper length, the ends of the bones are then to be placed in contact, and two splints, with a bandage, applied as already directed. It is advisable to apply a wooden splint on the outside of the fore-arm, until the pasteboard splints are sufficiently dry and firm; it is then to be taken away. When the patient is thin, it is customary to place a compress of soft linen or lint between the bones, both before and behind, to prevent them from approaching each other, and growing together. When pasteboard is not at hand, wooden splints may be employed, but the former is always preferable, because it readily takes the shape of the limb, and, when dry, forms for it a sort of firm mould or case.

FRACTURE OF THE FINGERS.

When a finger is fractured, the injury is easily recognized. The treatment consists in applying on the front of the finger a narrow wooden splint, padded with tow or lint, which is to be supported by a suitable bandage.

DISLOCATIONS.

In consequence of an accident, or some violence, a bone is occasionally dislodged from its natural situation, or, perhaps, removed out of its socket, whereby its proper functions are greatly impeded or obstructed, and, as such occurrences frequently take place at a considerable distance from any surgical assistance, it appears proper to point out a few of the most common cases of this kind, with the method of restoring them, through the medium of other persons possessed of a mechanical turn.

The dislocation of a bone is usually ascertained with ease, from its being attended with a swelling or degree of protuberance on one side, and a corresponding hollow on the other, which are particularly apparent on making a comparison between the member that has been injured and its fellow; by tension and pain, and by inflammation and febrile symptoms being present.

The usual causes of dislocations are, any sort of external violence suddenly and forcibly applied, as in falling, leaping, twists, blows, &c.

A recent dislocation may frequently be reduced with great ease by extending the limb, and using such a degree of force, in a gradual manner, either by the hands, or a towel tied round it, as will be requisite to overcome the power and resistance of the muscles. If, with the dislocation, there be a fracture of a part of the bone, the difficulty of reduction will be much increased, as well as the cure protracted. Moreover, when the reduction of a dislocated part has been long delayed, such as to the distance of some weeks, there will be but little prospect of being able to replace it, so that the patient will have a stiff joint, and, if the injury is in the lower extremity, will be rendered lame through life.

Treatment.—When the bone has been displaced for some time, and swelling and inflammation occupy the joint, it will be necessary to bleed the patient, and, after well fomenting the part with flannel cloths, wrung out in warm water, to apply soft poultices composed of oat-meal, oil, and vinegar, for a time, before we make any attempt to reduce it, which should never be done till the tension and inflammation have subsided.

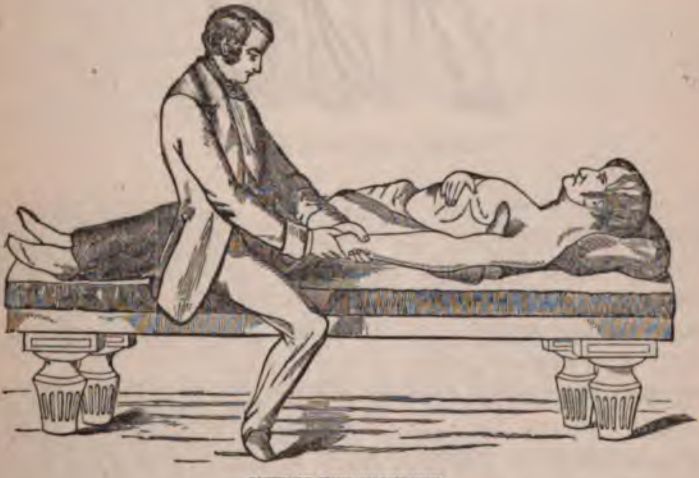
After the reduction has been effected in the manner before mentioned, all that will then be necessary is to apply one or two folds of linen cloth, wetted in vinegar or camphorated spirits, to the part, and keep it perfectly still and quiet, with the muscles in a state of relaxation. If it be the shoulder, arm, or elbow, the arm should be kept in a sling, fastened round the neck. If the lower extremity, it should be raised on a chair, or sofa, as high as that on which the patient sits. When a dislocation and fracture exist together, the healing of the fracture might first take place, previous to any attempt being made to reduce the disjointing.

DISLOCATION OF THE SHOULDER.

The head of the upper bone of the arm may and does slip out in different directions, in consequence of a fall, and other violences. It seldom takes place upwards, however, but most commonly downwards, in which case a hollow place is found in the upper part of it, easily perceived by pressing the finger on it. The head of the bone may also be felt in the arm-pit, and the patient cannot move the limb without experiencing severe pain.

In such a case there is a considerable difference in the length of the arm which has not been injured, when compared with the one which is dislocated, and, when it remains long in this state unassisted, a swelling and impaired sensibility of the limb ensue. Moreover, there is an inability to move the arm, and every attempt to do so is attended with considerable pain.

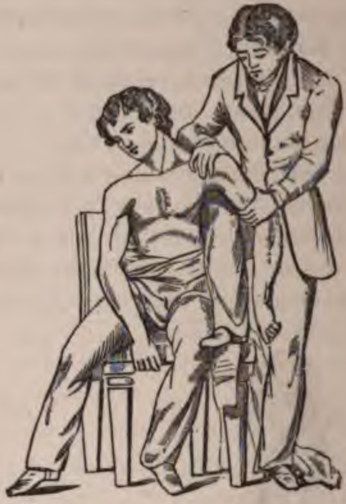
When the bone has been recently dislocated, and no tension and inflammation have come on, it may, in general, be readily reduced by employing a moderate force; but when it has remained out of its socket for a considerable time, the operation of reduction will prove both painful and difficult.



SETTING THE SHOULDER.

Treatment.—When a dislocation of the shoulder is accompanied with swelling and inflammation, the reducing it should be suspended until these have in a great degree subsided. The limb is to be kept perfectly at rest, and the part moistened with vinegar and water, by linen cloths wrung out therein.

As soon as the swelling and inflammation have subsided, the following course should be adopted. The patient is to be placed upon a low stool, an assistant is then to hold the body very firmly, so that it cannot give way on exerting the necessary force, whilst another person lays hold of the arm a little above the elbow, and gradually extends it, increasing the force as may be requisite. The operator then is to put a napkin under the patient's arm, causing it to be tied behind his own neck, and by this he is gradually to raise the head of the bone, whilst at the same time a considerable extension and resistance are effected by the assistants, and with his hands directs it into its right place, on which a slight crack or noise is usually heard. After the reduction the parts may be rubbed with camphorated liniment made gently warm, and the arm be kept very still by putting it into a sling.



SETTING A DISLOCATED SHOULDER.

Dislocations of the shoulder, though they may be readily set by a surgeon, are yet very serious injuries, and those who meet with such an *accident, or who have reason to suspect that it has happened to them, should avail themselves of skilled surgical assistance if it can be obtained.* It is proper to remark just here, that many of those who profess to be natural bone-setters, are really great humbugs. They often pretend to set bones that were never out of joint.

Should pain, swelling, or inflammation succeed the reduction of the bone, they are to be relieved by topical bleeding with leeches, laxative medicines, and a cooling regimen. If the limb remains in a weak state for any length of time in consequence of the injury, pouring cold water from a tea-kettle, or pumping on it, may be likely to strengthen it.

DISLOCATION OF THE ELBOW.

The bones of the fore-arm may be dislocated in various directions, and the injury may readily be discovered by the patient's inability to bend the limb, together with its stiffness, and a protuberance being observed on that side of the arm towards which the bone is pushed, although this is occasionally obscured by a degree of swelling and inflammation.

To reduce a dislocation at the elbow, it will be necessary to have the assistance of two persons, one of whom must hold the arm above, and the other below the joint; an extension is then to be made by one of them in a gradual manner, till the operator is enabled to return the bones into their proper place, after which the arm is to be bent, and kept suspended in a sling for a considerable time, the injured part being for a few days frequently wetted with equal parts of vinegar and camphorated spirits.

Dislocations of the wrists, fingers, &c., are to be reduced much in the same manner as those of the elbow, viz. by making a proper extension, and guiding the bones into their natural situation with the operator's fingers.

DISLOCATION OF THE THIGH-BONE.

The head of the thigh-bone may be dislocated in almost any direction, but in general it takes place inward and downward. In this case the knee and foot are turned outwards, and the leg is longer than the other. But when it is displaced backward, it is usually pushed upwards at the same time, by which the limb is shortened, the foot turned inward, and the head of the thigh-bone may be felt on examination.

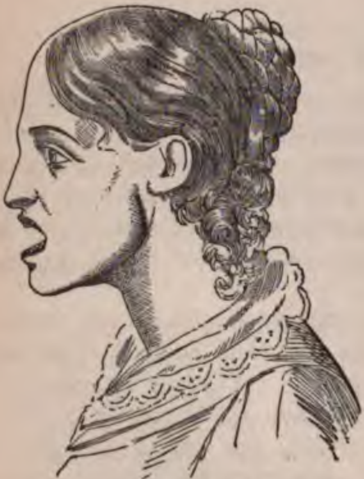
To replace this bone when it is dislocated forward and downward, the patient must be laid on his back, and either be held by proper assistants or fastened by bandages. A strong extension is then to be made by other persons through the means of a sling fixed on the thigh a little above the knee, and during this period the head of the bone is to be pushed outward by the operator, till it slips into its socket. If the dislocation be outward, the patient must be laid on his face, and while the assistants are making due extension, the operator is to push the head of the bone inward until it is replaced, to succeed in which effectually, a proper co-operation of the assistants in raising the bone must be attended to.

Dislocations of the knees, ankles, and toes are to be reduced by making a due extension in opposite directions, through the medium of assistants, while the operator replaces the bones in their right situation. When tension and inflammation prevail, active means by both general and topical bleeding, freely evacuating the bowels by purgatives, and confining the patient to a spare regimen, must be resorted to, not only in dislocations of the thigh-bone, but likewise in those of the minor ones.

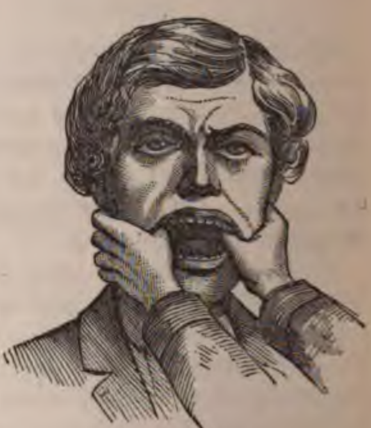
In very robust persons, the force of the muscles sometimes resists every effort to reduce a disjointed limb, in which case it may be well to excite some degree of languor and debility, either by putting the patient into a warm bath, or giving him a grain or two of tartarized antimony, the operator taking the advantage of the effect produced thereby previous to the act of vomiting, for reducing the dislocated bone; or by the inhalation of chloroform, or sulphuric ether.

DISLOCATION OF THE JAW-BONE.

To reduce a dislocation of the jaw-bone, the person is to be placed on a low stool, and his head being firmly held by an assistant, the operator is then to thrust his two thumbs, covered with linen cloths that they may not slip, as far into the mouth as he can, while his fingers are applied externally to the jaw. After he has



DISLOCATED JAW.



SETTING THE JAW.

got a firm hold of this, he is to press it strongly downward and backward, by which means the protruded ends of the jaw-bone may be easily restored to their proper cavities or sockets. The jaw is afterward to be kept still for some time, the patient avoiding mastication, particularly of any hard substance, till the parts have acquired their former tone.

DISLOCATION OF THE NECK.

When the neck is completely dislocated, speedy death ensues if it is not instantly replaced, owing to the pressure made by the parts on the spinal marrow. If it be only partially displaced, the life of the patient may be preserved if the reduction be promptly made.

When only partial dislocation of the neck has taken place, the chin appears fixed to the patient's breast, which prevents his speaking, swallowing, or at all moving the parts; his face is generally turned towards one side, his countenance appears bloated, and his neck swells. Moreover, he is deprived of sensibility.

The patient must be turned immediately on his back, and the operator place himself immediately behind him, so as to be able to lay hold of his head with both his hands, whilst a proper resistance is made by fixing his knees against the shoulders of the patient. The head is then to be pulled with some force, which is to be gradually increased, the head being moved at the time from side to side until the joint is replaced, and this may be known by the snapping of the bone when passing into its socket, as well as from the sensibility of the patient being in some measure restored, and his beginning to breathe.

After the dislocation has been reduced, the head should be secured in its place by a proper bandage, the parts be well bathed with camphorated spirits, the patient bled and put to bed, and the bowels freely purged. Until the tone of the injured part is properly restored, quietness will be necessary, and for a due length of time a spare diet will be advisable.

RUPTURES.

Ruptures are common to both sexes, although, from the peculiar structure of the parts where they most usually occur, they are far more frequent in males; and are occasioned by a variety of causes which tend to overcome that nice balance of forces, which exists in every individual, between the intestines themselves and the surrounding muscles which contain them; the first by their elasticity tending to escape outwards; the second by their contractile structure exerting a uniform compression, and opposing their displacement. There are, at the lower part of the belly, corresponding to the bend of the thigh, certain openings, by which vessels, &c., pass out; and it is through these openings that a bowel is protruded, when, by any sudden exertion, the whole mass are forcibly pressed downwards. Among the most common causes are violent horse exercise, or violent exertion of any other kind, more particularly when the body is tightly girt by stays, belts, high trowsers, &c. The causes which predispose to this accident, or, in other words, the peculiar state of the individual most favorable to its occurrence, is a laxity of fibre, from constitutional weakness, or from a previous dilatation or extension of the walls of the body from dropsy or child-bearing.

Be careful not to keep a truss on while a hernia is still down; it may excite an inflammation which will make it impossible to return it again, or it may indeed cause strangulation of the hernia and sudden death.

A hernia is comparatively a slight trouble so long as it is easily put back, but a slight injury may render it at any moment a most dangerous condition.

As this condition may be caused by a badly fitting truss alone, be careful either to wear no truss at all, or else to be sure that the one you use fits you accurately.

Ruptures in adults are rarely completely cured; but ruptures in children, if properly treated, may be considered as a rule pretty surely curable, with a permanent and satisfactory result.

The treatment must consist in the use of a good-fitting, easy truss, applied just as soon as the rupture is first discovered.

Do not delay treatment for a day; if you do, it will and must get worse and worse daily.

Not only must the truss be applied early, but its use must be maintained constantly; it must not be removed even for the time of using a bath or being washed, because a single momentary protrusion undoes all the good that it may have taken weeks to accomplish.

In the absence of a truss, while one is being procured in these cases, pass a narrow bandage around the body, and then from that pass another down the groin, and around behind the buttocks, fastening it by successive turns to the bandage behind. This will suffice to bind down over the seat of the rupture a little pad, which may be made of muslin or soft flannel, and prevent it from protrusion more or less during crying or violent motion of the little patient, until a truss be procured.

This complaint may exist for a considerable length of time, and cause no inconvenience to the patient, nor in any way affect his health; but notwithstanding this, should he neglect the use of the truss, or abandon it too early, under the impression that he is cured, and that he has no relapse of the accident to apprehend, he is but too frequently lulling himself into a fatal error; for the parts, from a slight cause, will again suddenly protrude, and often become difficult of reduction, or sometimes even incapable of being replaced. This latter state is what is generally termed strangulated rupture, and oftentimes requires a surgical operation; for it is, in certain cases, so dangerous, that without this, the patient's life must infallibly be lost.

Now, the use of the truss, be it clearly understood by every one, is to press upon the opening, and supply an artificial strength to the surrounding fibres, whose power of resistance has been overcome by the violence already spoken of. *It is quite evident, therefore, that the first thing to be done, when a rupture has been distinctly recognized, is to return the protruded parts into their natural place, and maintain them by an accurate and well regulated pressure for a considerable period of time.* No delay should ever be indulged in, whether the rupture be altogether new, or one which has been already long existing; for strangulation occurs so suddenly, that frequently, before a surgeon can be procured, or employ the means of his art, the danger has become insurmountable.

How, then, is a rupture to be recognized?—There is to be perceived, in the parts in which rupture usually takes place, a swelling, sometimes tense or elastic, at others soft and compressible, without any discoloration of the skin. The causes of the accident should be considered, and will probably reveal at once the fact. However, the more certain signs are, a variation in the size of the swelling from the position of the individual; being smaller while he is lying down, and larger when he is standing upright and holds in his breath; a disappearance, or at least considerable diminution, when pressure is exercised upon it, and a return to its former dimensions when that pressure is removed. The swelling is usually larger and more tense when the patient coughs, or after he has taken a full meal; but is, on the contrary, smaller and softer in the morning before he has broken his fast. He is often troubled with colic, vomiting, and constipation.

When the rupture is easily reducible, it is sufficient to place the individual in a convenient position, and exert a gentle compression upon the swelling from below upwards, and a peculiar gurgling noise will at once announce that the protruded bowel is restored to its proper place. But when, on the contrary, the rupture is strangulated, (which is known by the great hardness and pain under pressure, or from coughing, sneezing, or any other agitation of the body; by the absolute constipation; the continuance of vomiting; and the general symptoms of fever,) something more is required than a mere attempt at pushing up the intestine. The warm bath should be first employed. If this fail, bloodletting must be resorted to, which had better be practised while the patient is in the bath. It is hardly necessary to observe, that, in all such cases of danger, no time should be lost in procuring the aid of a surgeon; but such is the danger of a strangulated rupture or hernia attended with the symptoms last described, that it is highly advisable, when a considerable delay would take place before his arrival, to employ the means first pointed out, which are not only the best, but by far the most secure in the hands of others than regularly educated practitioners.

The position of the patient at the time of effecting the restoration of the intestine is of the highest consequence. He should repose on his back, his head and shoulders raised with pillows, his body bent, to put the muscles of the belly into perfect relaxation, by the knees being brought upwards. The person who officiates should then take hold of the neck of the swelling (for it is of the form of a pear the thick end downwards) with the left hand, while with the right he grasps the larger portion, and gently pushes the protruded parts upwards, which the left hand is intended to direct through the opening. This should be done very gradually, and patiently, and always in the direction in which the parts have protruded. It will sometimes require to be persisted in for a considerable time, (perhaps for an hour,) before all hope of reduction can be fairly given up. If violence be employed the greatest danger is liable to ensue; mortification being almost sure to follow.

While the patient is in the warm bath, and before the reduction is attempted by the hand, he should be placed as directed for the latter attempt, and not unfrequently the parts return of themselves.

When bleeding and the warm bath have been employed without avail, the end has been attained by dashing cold water over the parts. But this should only be done as a last resource.

BRUISES.

A SLIGHT bruise is of little consequence, and requires no particular attention; but when severe, it demands proper treatment. A severe bruise is followed by swelling and discoloration of the injured parts, as is exemplified when a blow is received on the eye, which causes what is commonly called a black eye. The extensive discoloration which, in many cases, arises from a bruise, alarms some patients; this is, however, a favorable sign. Danger arises in consequence of blood escaping from the vessels in particular situations, and not from the quantity discharged. Hence, a small quantity effused into the brain, in consequence of a blow on the head, or into the chest or belly, from a similar cause, will endanger life, and probably cause death; while a large quantity thrown loose under the skin, causing extensive discoloration, may be rapidly absorbed without much inconvenience to the patient. A severe blow received on a large joint always produces serious consequences; and a blow on the lower part of the belly may burst the bladder, if it happen to be distended with urine at the time, and cause death.

The effusion of blood under the skin is not the only effect of a bruise. The muscles, and other soft parts, are generally injured, and remain in a weak and painful state during a longer or shorter time, according to the severity of the injury; or they may be so destroyed as to deprive them of life. In this case *sloughing*, as it is called, or the separation of the dead parts from the living, must take place.

Treatment.—The first thing to be attended to in treating a bruise is to prevent inflammation. Cold lotions should be constantly applied to the parts. The sooner they are employed the better. When resorted to early, they are not only useful in keeping off and subduing inflammation, but tend also to prevent the further effusion of blood from the lacerated vessels. The best lotions are those in common use, namely, Goulard water and vinegar, or spirits and water. When the bruise is slight, and the injured parts kept at rest, no other treatment than this will be required. But if inflammation comes on in consequence of a severe bruise, leeches ought to be repeatedly applied, low diet strictly adhered to, and the bowels freely opened by occasional doses of cooling purgatives. Quiet is necessary. The inflammation which arises from a bruise seldom terminates in suppuration; but, if the formation of matter appears inevitable, the cold lotions should be discontinued, and warm poultices applied.

If the above means have had the effect of preventing or subduing inflammation, apply friction with opodeldoc, the compound camphor liniment, or sal-ammoniac, half an ounce, vinegar and spirits, of each twelve ounces, mixed.

The pouring of cold water from a height on the bruised parts two or three times a day, is one of the best remedies that can be used. Pressure by the application of a bandage rolled round the parts is also an excellent treatment. The application of electricity in bruises oftentimes is of very great service (see *Electricity*). It seems to aid absorption. The best method of application in such cases is with the hand of the operator.

BURNS AND SCALDS.

Burns are usually divided into four varieties or degrees.

In the *first* degree there is redness, slight swelling, heat, and acute pain of the part. These symptoms continue a few hours, or perhaps two or three days; in the latter case the injury terminates in a peeling off of the scarf-skin.

In the *second* degree there are, in addition to the symptoms of the first, vesicles (or bladders) filled with a transparent fluid of a pale, yellowish color; this fluid (or serum) lies between the true skin and the thin scarf-skin (or cuticle).

In the *third* degree the life of the (true) skin is destroyed, and the burned part presents a moist and soft surface of a yellowish or brown color, with or without vesicles, containing fluid of a dirty brown or of a bloody and turbid appearance; or it may be dry, black, and charred.

In the *fourth* degree the injury extends deeper than the skin, the fat and muscles are more or less destroyed, and the tendons, ligaments, and other parts, even as far as the bone, may subsequently inflame and mortify.

When parts are burned deeply, so as to destroy their vitality, the pain is less severe than when the surface of the skin only is injured.

When a great extent of surface is burned, the intensity of the pain may cause death in the course of a few hours.

After a burn of the worst description, the patient complains of being cold, his pulse is weak and almost imperceptible, and shivering usually comes on. If there be also great pain, he soon falls into a state of stupor or insensibility, which, if reaction do not take place, continues until death. This state of insensibility to pain seems wisely ordained to prevent the extreme suffering which would otherwise be the fate of the unfortunate patient.

Treatment.—It becomes every one to know how to act in case of such accidents, because burns are inflicted suddenly, medical men are not always at hand, and yet it is necessary to do something immediately, to relieve the acute pain which follows these injuries.

The want of presence of mind at the time of the accident often renders burns more severe than they otherwise would be. How frequently does it happen that females, when their dresses catch fire, instead of taking the most prompt means of extinguishing the flames, generally increase them by running about screaming for assistance, when they ought to lie down on the floor and roll over and over on the carpet. The erect position of course allows the flames to spread and rise rapidly to the head and neck—parts where the fire is most to be dreaded; whereas the horizontal position, on the contrary, has a considerable effect in preventing their extending. In such cases the hearth-rug, table-cover, a shawl, or any woollen article, are the things to be used by any one who may happen to be near, for the purpose of extinguishing the flames. It also frequently occurs when the legs and feet are scalded, that instead of cutting the stockings and removing them gently, they are drawn off, carrying the scarf-skin along with them; and the true skin being then exposed, the most excruciating pain is produced.

The principle on which burns are now treated is that of excluding them from the air; which may be done by covering the burned or scalded parts with flour, or enveloping them with cotton wool. It is in general advisable, before employing the cotton, either to immerse the parts in cold water, if their situation will admit of this being done, or apply to them pieces of fine linen dipped in cold water, or vinegar and water, and wetted frequently during several hours, or until the pain and heat are removed. But when the burned surface is extensive there is always a sensation of chilliness, which is generally accompanied with shiverings. In this case cold applications would do harm, and they ought not to be employed, even when the burn is slight, if there be a tendency to shivering; nor should they be continued if the patient be not relieved by them, or if they bring on shivering; and they are always improper when the injury is on the breast, belly, or on any part of the trunk of the body.

When the legs and feet are scalded, they should be plunged as soon as possible into cold water, and kept immersed in it a considerable length of time before the stockings are removed. By this means blisters are often prevented.

The blisters, or vesicles, which frequently make their appearance suddenly in consequence of a burn or scald, should be punctured with a needle, and the fluid allowed to escape. The burned parts are afterwards to be carefully washed with tepid water before applying flour or cotton.

The cotton employed should be finely carded, and then applied over the burned surface in thin layers, one over another, until there is a covering sufficiently thick to exclude the air, and protect the parts from undue pressure. Bandages are then to be applied over the whole of this envelop, so as to keep up a moderate and equal degree of pressure. In mild cases this dressing will be sufficient, and when removed in the course of ten or fourteen days, the part will be found covered with new skin. But if the discharge of matter be very profuse, it will find its way through the dressing, the soiled part of which must then be removed, allowing that which adheres to the skin to remain, and fresh layers of cotton applied with as little delay as possible, in order to prevent the action of the air on the burned parts. The dressing is to be renewed in this manner as often as it may be found necessary, until the cure is completed.

The application of flour to burned and scalded parts has long been popular. This method is preferable to the use of cotton, inasmuch as the flour relieves the pain almost as soon as it is applied, thus rendering the application of cold lotions unnecessary.

In cases of deep burns, treated either by cotton or flour, it becomes necessary to remove the dressing and examine the parts about once a week, until the sloughs have separated, and the subsequent discharge of matter is diminished. After the dead parts have been detached, it is often found difficult to keep down proud flesh; in such cases pressure over the dressing by means of sheet lead has an excellent effect when properly graduated. The principal advantage derived from cotton or flour is during the acute stage; and therefore, when the crust or paste formed in the manner above mentioned is detached from the ulcerated surface, the ulcers may either be treated by astringent lotions, pressure, keeping the proud flesh under by touching it with lunar caustic or blue vitriol, and the other means in general use in such cases (see *Ulcers*); or the flour or cotton may be re-applied and removed every six or eight days until a cure is effected.

The dressings should be changed quickly, so that the parts may be exposed as little as possible to the air; and when the burned surface is extensive, it must not be all exposed at once. *Another and more recent remedy for burns is carbolic acid.* It may be used in solution—ten to twenty grains to the ounce of water.

In whatever manner burns may be treated, the greatest care must be taken to prevent contractions of joints, and improper adhesions between the raw surfaces. The position ought always to be such as to keep the skin extended. Hence, when the front of the arm and fore-arm, or the back of the leg and thigh, are burnt, splints are required to keep the limbs extended; but attention must be paid not to allow the joints to become stiff by retaining them too long in one position; they ought to be moved by an attendant from time to time in order to prevent rigidity, otherwise it might afterwards be both a tedious and difficult matter to restore them to freedom of motion. To prevent raw surfaces from adhering to each other they must be kept separated by placing something between them; for example, to keep the fingers from growing to each other, it is usual either to place strips of adhesive plaster between them, or to keep them extended on a hand-board.

In slight burns no internal treatment is necessary, repose and low diet are sufficient; but in severe cases, when there is shivering, or a tendency to it, and the patient complains of being cold, and has sickness at stomach, a pale countenance and weak pulse, stimulants are indicated; a little brandy or wine and warm water, with six or eight drops of laudanum, are to be given occasionally; and bottles of hot water, or hot bricks, are to be applied to the feet, until the system recovers from the sudden shock which it has received, and reaction takes place. The warm bath is the best thing for restoring reaction in children.

During the inflammatory stage the diet must be very sparing, and confined to vegetables, fruit, and farinaceous substances; and barley-water, with thirty or forty grains of nitre, may be given in the course of the day, or the patient may drink freely of soda-water, lemonade, or any other cooling beverage. Attention should also be paid to the state of the bowels, which are to be kept moderately open, without producing purging; for this purpose castor-oil is preferable to saline medicines, which might bring on shivering. The feverish symptoms, after being absent for many days, may return at the time when the eschars or sloughs are being detached, and the same treatment is then again requisite.

When there is much ulceration, with a free discharge of matter, the patient's strength must be supported by light and nourishing diet, such as soup, jelly, and light puddings; and at dinner a little chicken or fish, with a moderate quantity of wine or porter, may be allowed. In this stage it is also advisable to give a grain of quinine in port-wine twice or thrice a day, in order to increase the appetite and promote digestion.

We wish to turn the attention of our readers to a preparation designed for injuries upon the surface of the skin, whether by violence, burns, or otherwise. It consists simply of a solution of gun cotton (a recent discovery) in ether, or collodion (see *Collodion*). Upon the application of this liquid the ether almost instantly evaporates, leaving upon the surface of the wound an almost imperceptible shield, answering the purpose of a new and instantaneous *epidermis*, or outside skin; thus protecting the wound securely from the aggravating influence of the air, dust, &c.

Yet the *common* gun-cotton, although partially soluble in ether, and forming a shield analogous to what we have described, is not a perfect preparation. The gun-cotton should be prepared with particular reference to this specific purpose. Otherwise it will leave a deposit upon the wound resembling whitewash; whereas the preparation which we recommend leaves, as we have said, a shield almost imperceptible to the eye.

TO RESTORE PERSONS APPARENTLY DEAD FROM DROWNING.

THE DIRECT METHOD OF PROF. BENJAMIN HOWARD, OF NEW YORK,

As taught under the auspices of the METROPOLITAN BOARD OF HEALTH OF THE CITY OF NEW YORK.

RULE 1.—*Unless in danger of freezing, never move the patient from the spot where first rescued, nor allow bystanders to screen off the fresh air, but* INSTANTLY *wipe clean the mouth and nostrils, rip and remove all clothing to a little below the waist,* RAPIDLY *rub dry the exposed part, and give two quick, smarting slaps on the stomach with your open hand.*

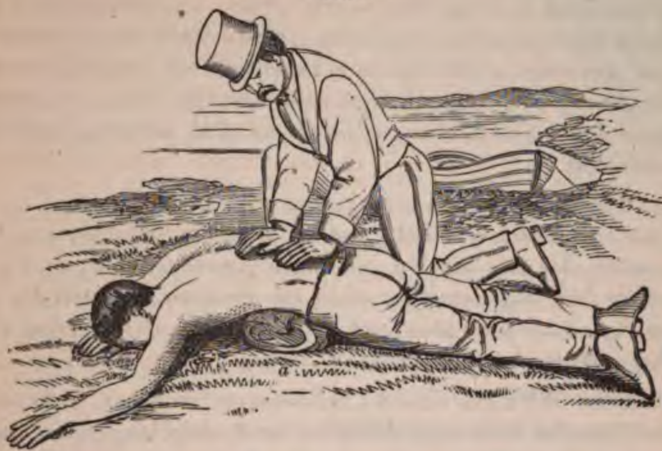
If this does not succeed immediately, proceed according to the following rules to perform artificial breathing:

RULE 2.—*Turn the patient on his face, a large bundle of tightly rolled clothing being placed beneath his stomach, and press heavily over it upon the spine for half a minute.*

RULE 3.—*Turn the patient quickly again on his back, the roll of clothing being so placed beneath it as to make the short ribs bulge prominently forward, and raise them a little higher than the level of the mouth. Let some bystander hold the tip of the tongue out of one corner of the mouth with a dry handkerchief, and hold both hands of the patient together, the arms being stretched forcibly back above the head.*

RULE 4.—*Kneel astride the patient's hips, and with your hands resting on his stomach, spread out your fingers so that you can grasp the waist about the short ribs. Now, throw all your weight steadily forward upon your hands, while you at the same time squeeze the ribs deeply, as if you wished to force everything in the chest upwards out of the mouth. Continue this while you can slowly count*—ONE,—TWO,—THREE;—*then* SUDDENLY *let go, with a final push, which*

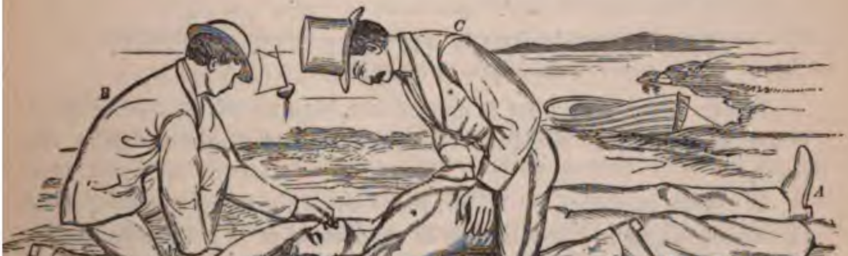
FIG. 1.



MODE OF FORCING AND DRAINING OFF WATER AND OTHER ACCUMULATIONS FROM THE STOMACH, THROAT, AND MOUTH, ACCORDING TO RULE 2, PREPARATORY TO PERFORMING ARTIFICIAL BREATHING.

a, Patient's clothing rolled tightly.

FIG. 2.



MODE OF PERFORMING ARTIFICIAL BREATHING ACCORDING TO RULES 3 AND 4.

A, Posture of patient according to Rule 3—arms extended backward, and ribs thrown prominently forward by roll of clothing (*a*) beneath back.

B, Assistant holding tongue, so as to prevent it falling back into the throat and blocking up air-passages to chest. By using handkerchief or similar article, the tongue cannot slip from the grasp. *b*, Right hand of assistant grasping both wrists of patient, keeping arms forcibly extended backwards. If not available, the assistant may be dispensed with.

C, Operator forcing out of chest all foul air, preparatory to the *sudden* letting-go, which compels an inrush of fresh air, *on the principle of the ordinary bellows*. The operator may, if he choose, kneel beside the patient, or in case of a child, where little force is required, may conduct the process in any attitude most convenient.

springs you back to your first kneeling position. Remain erect upon your knees while you can count—ONE,—TWO;—*then throw your weight forward again as before, repeating the entire motions—at first about four or five times a minute, increasing the rate gradually to about fifteen times a minute, and continuing with the same regularity of time and motion as is observed in the natural breathing which you are imitating.*

RULE 5.—*Continue this treatment, though apparently unsuccessful, for two hours, until the patient begins to breathe; and for a while after this help him by well-timed pressure to deepen his first gasps into full, deep breaths; while the friction of the limbs, which should if possible have been kept up during the entire process, is now further increased.*

RULE 6.—AFTER-TREATMENT—EXTERNALLY. *As soon as the breathing has become perfectly natural, strip the patient rapidly and completely. Enwrap him in blankets only. Put him in bed in a room comfortably warm, but with a free circulation of* FRESH AIR, *and except for the administration of internal treatment, let him have* PERFECT REST.

INTERNALLY. *Give a little hot brandy and water, or other stimulant at hand, every ten or fifteen minutes for the first hour, and as often thereafter as may seem expedient.*

THE PHILOSOPHY OF THE TREATMENT.

Death from drowning is caused not because of the presence of water as such, but because of the absence of fresh air from the chest.

Whether excluded by water, as in drowning; by a cord closing the windpipe, as in hanging; by dense smoke, as in a burning building; by foul gas, as in an old well, or from escape of ordinary burning gas into a close room; whether by burying the face in a soft pillow, or by a piece of tough meat lodged in the throat, corking up the entrance to the windpipe—in all these cases the immediate cause of death is one and the same.

The BREATH is the LIFE. Let it be shut out from the chest, or anything else be entirely substituted for it, and *suffocation* at once begins, and this continued always ends in *death.*

To avert death, then, and reawaken life in all these cases, you must not begin by giving a little stimulus, or "something reviving," as it is called; not by applying hot blankets, nor putting the patient into a nice warm bed. The first and instant necessity is, if possible, to GIVE *breath* until the patient is sufficiently recovered to be able to TAKE *breath* for himself. This alone can start life again, and maintain it in action. If the draft and door of a stove is long kept tightly closed the fire dies away to an interior spark. If in this condition you begin to put in more coal, your disturbance is very likely to completely extinguish the remaining spark.

To apply heat in any form to the *outside* around the stove would be simply absurd and ridiculous. If, on the contrary, you should open the draft, rake away the ashes and dead coals from the mouth of the draft up to the interior spark, open the damper and set a current of air in motion through the stove, or in a great emergency add a few gentle steady puffs from the bellows, you would be adopting what all experience proves to be the most sensible and only successful way to rekindle your fire to brightness and warmth.

The relation of fresh air to the burning of a fire is precisely what it is to the reviving and continuance of life. Therefore, if the friction, the breeze, and the slap upon the nerves over the stomach, as directed in *Rule* 1, fail to startle and revive the patient, then it is necessary to at once see that the track from the mouth to the chest is clear, so that the passage of air to the chest be not obstructed.

By following the directions of *Rule* 2, fluids accumulated in the stomach, chest, or throat are removed. The stomach, at a greater elevation than any other part of the track, is pressed between the roll of clothing and the spine, whence water or other accumulations have a complete *drainage* down to and out of the mouth, which is the lowest point.

The next step is to induce air to enter the chest by what is called artificial breathing or respiration. *Rule* 3 prevents the tongue tumbling back into the throat, to choke it up as by a piece of dead meat, and provides for its tip being kept out and to one side of the mouth. Also by keeping the arms well stretched back, helps to keep the chest somewhat expanded.

The actual breathing is effected by the directions in *Rule* 4. In order to understand this, it must be remembered that the chest containing the elastic lungs is an open-work, ribbed, bony box, which above the bottom of the breast-bone is scarcely movable, except by one's own will, the ribs being fastened both in front to the breast-bone and behind to the spine. The ribs below the breast-bone, known as the short ribs, are fastened only behind to the spine; they are very elastic and loose, and thus are called the floating ribs.

It is this enables any foolish woman to diminish the size of her waist to any standard fashion may demand.

All the breathing necessary to life can be performed by this part of the chest alone, as is generally the case during sleep.

When the pressure is made upon this part of the chest, then, as directed in *Rule* 4, the cavity of the chest is greatly diminished; what air is in it is partially forced out, and on suddenly letting go, the natural elasticity of these semi-cartilaginous ribs compels them to spring back to their natural position. This would create a vacuum, but that the fresh air is thus compelled to rush in through the mouth to occupy the otherwise vacant space.

This action, repeated as directed, compels successive volumes of fresh air to enter the chest just as occurs in natural breathing, and so it is called and constitutes "artificial breathing" or "artificial respiration."

The first returning natural gasps are apt to be irregular, and if the artificial breathing be continued regardless of them, the motions of the operator may actually interfere with and interrupt them; therefore, as directed in *Rule* 5, let your motions be so timed to the natural effort of the patient as simply to aid and deepen his breathing, which is as yet imperfect and insufficient.

With life comes heat, but the latter may be greatly favored by following the direction in *Rule* 6. *Warmth*, *rest*, and *fresh air* are now to be regarded as important means of completing the resuscitation already begun.

To make this chapter more complete, the following method of artificial respiration, known as Marshall Hall's, or the "Ready Method," is appended; it is described by its author as follows:

"Place the patient on his face, his arms under his head, that the tongue may fall forward, and leave entrance into the windpipe free, and that any fluids may flow out of the mouth; then

"Turn the body gradually but completely on the side and a little more, and then again upon the face alternately, to induce inspiration and expiration.

"When replaced, apply pressure along the back and ribs, and then remove it to induce further expiration and inspiration, and proceed as before.

"Let these measures be repeated gently, deliberately, but efficiently and perseveringly, sixteen times in the minute only."

HANGING AND SUFFOCATION.

Hanging induces death chiefly because the rope closes the windpipe, and keeps fresh air from the lungs. *Suffocation*, whether caused by something covering the mouth, or by smoke, foul gas of wells, or other noxious vapors, causes death from the same cause equally, viz., by preventing fresh air from reaching the lungs.

In hanging, the first thing is instantly to cut and remove the cord. Then proceed at once to perform artificial breathing, as directed in drowning, dispensing, of course, with the attempt to remove accumulations from the mouth or chest, and being careful to keep the head raised a little more than in the position after drowning, because in hanging the head becomes filled with blood, and this congestion is partly relieved by a more elevated position of the head.

In *suffocation*, proceed simply with the process for artificial breathing, just as for hanging.

STILL-BIRTH.

If the infant does not breathe immediately on coming into the world, be careful not to divide the navel-string for the present, because so long as that is complete the blood of the mother continues to nourish the child, just as it did in the womb. Wipe cleanly from its mouth and nostrils all mucus, and give it a smart slap with your open hand upon the belly. Dash upon its face sharply a little very cold water, then a little warm water, then a little cold water. If this does not succeed cut the cord, wrap the child in flannel, and proceed at once with artificial breathing, as for suffocation, but with this difference:—remember the infant has never once had any air enter its lungs, so there is none which by pressure can be displaced, therefore it is better to try and blow up its lungs first, and apply pressure afterwards; or let one person blow while another person makes the pressure for artificial breathing. In order to do this properly, wipe the nose and lips of the child very clean; open the mouth wide, by pressing your fore-finger down upon the tongue and lower jaw. Let some one else press upon the larynx, or Adam's apple, as it is called, so as to keep it at the back part of the throat, and prevent any air from passing behind it into the stomach. Now apply your lips to the lips of the child, and steadily and forcibly blow, not quite emptying your own chest. Now let your assistant make the pressure, as described; then blow again, and so on, alternating the blowing and the pressure, in imitation of natural breathing; continuing the process, if necessary, for an entire hour, without intermission.

HEMORRHAGE FROM WOUNDS.

Firm, steady pressure on the bleeding part is the first treatment for bleeding wounds in every case, and will usually be at once successful.

Cold—ice or ice-water—is very efficient when only small blood-vessels have been divided.

Pressure above the wound, applied in the course of the artery, is more reliable than either the other methods. In the arm or thigh this may be made and continued by tying a stone in a handkerchief, allowing the stone to rest right over the course of the artery, and then tighten it thereupon, by twisting the ends of the handkerchief around a stick, constituting a tourniquet sufficient to control the most violent hemorrhage, until the patient can be better cared for.

TREATMENT OF PERSONS STRUCK WITH LIGHTNING.

"When persons happen to be overtaken by a thunder storm, although they may not be terrified by lightning, yet they naturally wish for shelter from the rain which usually attends it, and therefore, if no house be at hand, generally take refuge under the nearest tree they can find. But in doing this they unknowingly expose themselves to a double danger; *first*, because, their clothes being thus kept dry, their bodies are rendered more liable to injury, the lightning often passing harmlessly over a body whose surface is wet; and, *secondly*, because a tree or any elevated object, instead of warding off, serves to attract and conduct the lightning, which, in its passage, frequently rends the trunks or branches, and kills any person or animal who happens to be close to it at the time. Instead of seeking protection, then, by retiring under the shelter of a tree, hay-rick, pillar, wall, or hedge, the person should either pursue his way to the nearest house, or get to a part of the road or field which has no object that can draw lightning towards it, and remain there until the storm has subsided.

"It is particularly dangerous to stand near leaden spouts or iron gates at such times; metals of all kinds have so strong a conducting power for lightning, as frequently to lead it out of the course which it would otherwise have taken.

"When in the house, avoid standing near the window, or door, or walls, during a thunder-gust. The nearer you are placed to the middle of a room the better.

"When a person is struck by lightning, strip the body and throw bucketsful of cold water over it for ten or fifteen minutes; let continued frictions and inflations of the lungs be also practised; let gentle shocks of electricity be made to pass through the chest, when a skilful person can be procured to administer them; and apply blisters to the chest."

TREATMENT OF APPARENT DEATH FROM THE EFFECTS OF COLD.

The body should be brought into a room in which there is no fire, and rubbed with snow or cloths dipped in cold water. The frictions should be directed from the stomach towards the extremities. In a few minutes after, the temperature of the water should be very gradually increased, so as not to heat the body suddenly. Stimulants may be applied to the lips and nostrils.

The lungs must be inflated as in the treatment of the drowned. When the natural warmth of the body is returning, the patient should be put into a bed, wrapped in dry blankets, and be well rubbed with a flesh-brush. A little weak wine and water may be given, or a clyster administered containing a little wine or something slightly stimulative.

Strict diet should be adhered to for some time after recovery.

When the limbs only are frozen, the application of snow or wet cloths is to be confined to the affected parts; half a teaspoonful of hartshorn in a glass of water may be advantageously administered, or a little weak spirit and water.

CONVULSIONS IN CHILDREN.

In children there are two remarkable kinds of convulsions, namely, what are called inward fits, and the common violent convulsions. The inward fits occur generally during sleep, and are known by the corners of the mouth being drawn up into a sort of smile; the eyelids are open, and the eyes are usually turned up, so as to show the whites. There is a fluttering in the breathing, and the child frequently starts. Fits of this kind are generally relieved by a warm cordial medicine, such as a little aniseed or syrup of rue; appearing as they do to depend on wind and flatulence of the intestines.

As to the more violent convulsions, they depend on disorders of the nervous system, most usually brought about by the irritation dependent on teething. The symptoms by which such convulsions may be known are these:—There is spasm throughout the muscular system, the arms and legs are drawn up and agitated, the body drawn back, the eyes are either fixed in their sockets, or are rolled to and fro, the child grinds its teeth, and the countenance is distorted. Sometimes there is a sort of breathing, which resembles greatly the breathing in croup. The first thing to be done is to place the child in a warm bath, to which a handful of mustard or salt may be advantageously added, and while in the bath to sprinkle cold water upon the head. A clyster should also be administered. After remaining some time in the bath, if the violence of the symptoms is but little mitigated, the child should be removed, and after being wiped dry, the spine should be rubbed with spirits, or hartshorn and oil, and mustard poultices applied to the feet. But whenever there is reason to believe that the convulsions are from teething, the gums should be immediately and freely lanced. A sharp pen-knife will serve perfectly well in this operation, which any one would be able to perform. At times, however, the child is weak and pale, and then, instead of applying leeches or bleeding, a little stimulant medicine should be given, containing two or three drops of laudanum.

When the child has recovered from the fit, it is usual to give a dose of calomel with a little rhubarb, in quantity proportioned to the age.

POISONING.

There are many different kinds of poisons. There is poison in the water we drink, and in which we bathe. But within certain limits, poisonous substances, when properly diluted, may be beneficial, and not injurious. There are poisonous ingredients in the ordinary articles of diet, and some of the best qualities of food contain the most powerful poisons. Flesh, fish, and wheat are the three most digestible and most nutritious of our common alimentary substances, and yet they contain phosphorus—one of the most virulent of poisons.

But beyond certain limits poisonous substances cannot be taken without injury.

Carbonic acid may be breathed for years in moderate doses; but in large quantities, as it is sometimes found in deep wells, it will prove instantly fatal.

Nearly all of our best medicines are poisons, some of them of the most virulent character. In small doses they benefit; in large doses they may work terrible mischief.

The same remarks will apply to stimulants and narcotics, all of which contain more or less poisonous substances. (See *Stimulants and Narcotics.*)

It is not necessary, in a treatise like the present, to enter into particulars relatively to the modes of action of the numerous descriptions of poisons to which the unfortunate who resolve on suicide have recourse, or to which such as are the victims of their own carelessness or that of others, or even of circumstances purely accidental, are but too often exposed. They are for the most part extremely doubtful, and can serve only, when understood, the members of the profession. Happily, however, the antidotes to the greatest number of poisons are perfectly well known, and it is to their skilful administration that it is most necessary to attend.

Our purpose is to state as clearly and as fully as the nature of the work will admit of, the means of distinguishing the kind of poison swallowed, (where there is doubt upon the subject,) deduced from the symptoms which invariably ensue, in order that the proper antidote may be at once administered.

Poisons are so numerous, that it would be more than absurd to attempt to describe them all; it would be attended with danger, resulting from the confusion in which a person would be thrown from the examination of so much detail. Those only will be mentioned which are the most commonly made use of; and they will be arranged in such a manner, that each respective group will embrace those which have a common train of symptoms, and require similar modes of treatment to counteract their effects.

It must not be supposed, that the descriptions here given of the symptoms of each respective class of poisons, are to be all met with at the same time; for it is with poisoning as with other disordered states of the system, the symptoms are by no means constant; yet, herein, the symptoms, as they will be found grouped, are sufficiently characteristic to lead to the detection of the nature of the poison, when the judgment is not aided by the light of more favorable circumstances.

For the sake, then, of simplicity and of real utility, they will be arranged in the following classes.

1. CONCENTRATED MINERAL ACIDS.

The most common concentrated mineral acids are, Sulphuric Acid, or *Vitriol;* Nitric Acid, or *Aqua fortis;* and Muriatic Acid, or *Spirits of Salts.*

Common Characters of Symptoms.—Astringent taste, with burning heat; acute pain at the entrance and along the course of the gullet, and also at the stomach; an insupportable stench from the breath, nausea, and the abundant vomiting of a liquid, sometimes black, at others reddened with blood, and which effervesces when it falls upon the pavement or upon chalk or whiting; hiccup; sometimes constipation, sometimes stools tinged with blood; acute pain in the belly, extending to the chest; difficulty of breathing; coldness of the feet and hands, and cold sweats; the desire but impossibility of urinating; the voice altered, and sometimes resembling the sound observable in children who suffer from the croup; the lips and inside of the mouth covered with black or white gangrenous spots.

The following are the more distinctive characters of each of the above poisons;

Vitriol is remarkable for reducing to a black pulp the parts it touches.

Aqua Fortis produces, on the parts it touches, lemon or orange colored spots.

Spirits of Salts disengages thick white fumes of a very penetrating smell.

Oxalic Acid (a vegetable poison) has occasionally been taken through mistake for Epsom Salts, which it strongly resembles in appearance. The treatment for it is the same as for mineral acids.

Treatment.—The patient should be made to drink freely of liquids containing in suspension a quantity of calcined magnesia; or, when the latter cannot be procured, water in which soap is abundantly dissolved; after which may be given linseed or marshmallow tea, or barley-water. These same remedies should also be administered in the form of clysters.

When it is presumed that the acid has been neutralized, and that it has been ejected from the inside, and it is perceived that inflammation has set in, let leeches be applied to the pit of the stomach and to the throat; let warm fomentations be constantly applied to the belly, or very large warm poultices. Should there be cramps or convulsions they ought to be treated by antispasmodics.

2. ALKALIES.

These are usually Potash, Soda, Ammonia (generally in a liquid state, as in the form of hartshorn) and lime.

Common Characters of Symptoms.—The symptoms much resemble those present in cases of poisoning by the mineral acids, but they more particularly affect the throat. The vomited matters, however, do not effervesce upon the pavement, or upon chalk or whiting. The action of ammonia (hartshorn,) is by far the most powerful, giving rise to horrible convulsions.

Treatment.—The patient should be made to swallow, from time to time, a glass of water containing the juice of a lemon or a tablespoonful of vinegar; if neither of these are at hand, warm water should be given abundantly, and vomiting excited by tickling the throat.

If olive oil can be readily obtained, it might be advantageously administered, as it would form a soap, which would be easily got rid of by the last means above described

3. METALLIC POISONS.

Arsenic. White arsenic—yellow arsenic—the *Ague-drop.*

Copper. Blue vitriol—Verdigris—The peculiar poison found where copper coins are put into the pot in which greens are boiling, to give them a bright green color, or when the latter are boiled in copper vessels.

Lead. White lead—Ceruss powder—Goulard's extract or Goulard water—Litharge—Red lead—Sugar of lead.

Antimony. Tartar emetic,—Antimony wine,—James's powders

Silver. Lunar caustic.

Mercury. Corrosive sublimate—Vermilion.

Iron. Green vitriol.

Zinc. White vitriol.

Tin. Salts of tin, used by dyers.

Common Characters of Symptoms. The patient experiences an acrid and metallic taste in the mouth, with a sense of constriction at the throat; pains, at first slight, afterwards most severe, along every part of the digestive canal; nausea, and vomiting of matters which do not effervesce; a continual and ardent thirst; difficulty of urinating; hiccup, difficulty of breathing, and a sensation approaching to that of suffocation; cramps and convulsions; and lastly, the limbs become cold, indicative of approaching dissolution.

Treatment. In all these cases, vomiting is the first thing to be attended to, and should invariably be produced, but before giving fluids to the patient; for these, by dissolving more completely the particles, and spreading them over a wider surface, increase the liability of absorption. There are, however, some of these poisons which require in addition other means; as, for instance, *Antimonial preparations*, which require the administration of an infusion of Peruvian bark, or other astringent barks, or even of common tea, which is a good antidote. If the pains still continue very violent, a grain of opium, or twenty drops of laudanum, may be administered every three hours till they abate; or a table-spoonful of syrup of poppies at the same intervals, mixed with a glass of water.

Lunar caustic requires the frequent administration of a tea-spoonful of table salt in solution.

Arsenical preparations should be treated with linseed or marshmallow tea, or barley water.

For *salts of tin*, the best antidote is milk.

For *corrosive sublimate*, the whites of a dozen eggs should be mixed with two pints of cold water, and a glassful given every two minutes.

For the *preparations of lead*, Epsom or Glauber salts, dissolved in water in the proportion of a dessert-spoonful to a quart, administered frequently by glassesful. If plaster of Paris is at hand, it should be given, in the absence of salts, mixed with water.

When, however, inflammation has set in, as it most often does, the then *after-treatment* requires the same measures to be employed as those which have been pointed out for the after-treatment of poisoning by mineral acids.

4. VEGETABLE POISONS.

1. Opium or Laudanum, Prussic Acid, Laurel-water, Henbane.

General Character of Symptons.—Numbness all over the body, with weight and swimming in the head; nausea, vomiting, state of intoxication; swelling of the eyes; slight convulsive movements. The pupil of the eye afterwards becomes greatly dilated, and the patient falls into a torpid state resembling apoplexy.

Treatment.—For prussic acid and laurel-water, tickling the throat or an emetic, to excite vomiting; afterwards, strong coffee, or coffee with a little brandy or turpentine, or hartshorn and water.

For opium or laudanum, and henbane, emetics to excite vomiting, but administered in very small quantities of water; an active purgative clyster, when it is supposed that the poison has reached the bowels.

After the poison has been evacuated, drinks should be given freely acidulated with lemon-juice or vinegar, and then strong coffee. To overcome the numbness of the limbs they should be vigorously rubbed with a flesh-brush or a piece of flannel; and the patient should be constantly moved about, and spoken to, to prevent his sleeping. For opium the best single antidote is *atropine*, in doses of one-thirtieth of a grain and upwards. (See *Atropine.*)

2. Monkshood, Hellebore, Tobacco, Foxglove, Meadow-saffron, Hemlock, Deadly Nightshade.

General Character of Symptoms.—Excited state of the nerves; the patient is greatly agitated and convulsed; there is delirium, the pupil of the eye becomes dilated, and sometimes violently contracts; vomiting, looseness of the bowels, with extreme pain all over the belly. Occasionally there is a great prostration of strength, insensibility, trembling, desire and incapability of vomiting.

Treatment.—The same as in poisoning by opium, &c.

3. Nux Vomica.

General Character of Symptoms.—After the poison has been swallowed, the patient undergoes, alternately, a state of calm and one of horrible spasmodic contraction of all the muscles of the body. These attacks rarely extend beyond the fifth or sixth, and terminate by death the patient's sufferings.

Treatment.—A vomit; afterwards the following mixture:—A teaspoonful of ether, one of spirits of turpentine, and half a tumblerful of water sweetened with sugar. Give a tablespoonful every seven or eight minutes.

4. Poisonous Mushrooms.

General Character of Symptoms.—Weight and pain at the pit of the stomach; then nausea, violent pains in the stomach and bowels, with vomiting and looseness; cramps and convulsions; unquenchable thirst; sometimes delirium, at others, stupor; lastly, faintings and cold sweats.

POISONOUS MUSHROOMS.

The symptoms only come on from seven to fourteen hours after the swallowing of the poison.

Treatment.—Active emetics and purgative clysters; afterwards, antispasmodics (the mixture prescribed for poisoning by ratsbane) and water acidulated by vinegar.

5. Ergot of Rye (Blighted rye, Spurred rye).

This is a peculiar excrescence which appears upon the ear, in the form of a long grain, very slightly curved, three-sided, and pointed at each extremity, of a dark violet color; it is a disease of the corn which appears in wet seasons.

General Character of Symptoms.—An unpleasant tickling or creeping sensation at the palms of the hands and the soles of the feet; heaviness in the head; occasional blindness, delirium, and intoxication; spasmodic contraction of the muscles, violent convulsions, and foaming at the mouth; afterwards, violet-colored spots appearing all over the body.

POISONOUS MUSHROOM.

Treatment.—No emetics! Alternate doses of an antispasmodic mixture and water acidulated with vinegar. If gangrene or mortification ensues, the medical practitioner alone can treat it properly.

5. ANIMAL POISONS.

1. Poisonous Mussels.

General Character of Symptoms.—About three or four hours after eating poisonous mussels, an uneasiness is felt all over the body, succeeded by numbness, and afterwards by intense pain at the pit of the stomach excessive thirst, and continual nausea.

If vomiting do not take place, the belly becomes considerably swollen, the symptoms increase altogether in intensity, and very often a rash appears on the face, which sometimes extends itself over the rest of the body. Lastly, delirium sets in, convulsions, and cold sweats.

Treatment.—Emetics, or the tickling of the throat to induce vomiting; afterwards, cordials, ether, and drinks acidulated with vegetable acids.

2. Spanish flies.

General Character of Symptoms.—These are very remarkable, the poison affecting to a horrible degree the urinary organs and the organs of generation.

Treatment.—Linseed tea, or other emollient drinks; from 12 to 20 drops of laudanum every four hours; frictions of spirits of camphor all over the body.

CUPPING.

The principal use of cupping will be found in its being a substitute for leeches, when the topical abstraction of blood becomes requisite, and these animals are not at hand. Military, naval, and country physicians are frequently unprovided with the usual instruments, and they resort in such cases to the following means:

They provide themselves with three or four wine-glasses (those which have the stems broken off are the most commodious), or the same number of *small* beer-glasses, a lancet, a little strong spirits, a sponge or some pieces of soft rag, two towels, or a sheet and towel, and a basin of warm water. Whatever glasses be employed, they should be quite level at the edges, in order that they may lie perfectly flat.

To commence the operation, the patient must lay bare the part to be acted on, below which one of the towels or a sheet is to be placed, to protect his clothes or the bed-linen.

Being thus prepared, the operator takes one of the glasses and introduces therein a few drops of ardent spirits, which he allows to spread over the sides; and then, holding it for an instant to the flame of a candle or bit of lighted paper, applies it, whilst the spirit is still inflamed, with the utmost rapidity, and with the mouth of the vessel downwards, flat upon the skin. In a few seconds, in consequence of the vacuum formed in the glass, the parts become engorged with blood and greatly swollen, the glass remaining firmly fixed by the atmosphere, which presses on it at the rate of 15 lbs. to the square inch of surface which it covers.

The effect of this application may be favored by dashing cold water over the surface of the glass while it is still hot, which causes the little air remaining therein to become more speedily condensed.

As soon as one glass has been applied, the rest should be applied in succession, and in the same manner; and after they have remained on from four to six minutes, or more, to give time for the afflux of blood into the parts, the first glass is to be lifted off, which is readily done by putting the nail under the edge and allowing the entry of the air. The operator then takes the lancet, and makes a number of rapid incisions *into* the skin, but *not quite through* it, if this can be avoided, drawing the lancet from the shoulders to the point. During this part of the operation, an assistant should wipe the glass quite dry; and the operator, introducing into it a few more drops of spirits, applies it as before, first to the flame, and then with rapidity upon the skin. He then proceeds to take off the second glass, scarifies the parts, and re-applies it as before directed; doing the same with the remainder, one only at a time. When the last has been re-applied, the first will be found sufficiently full of blood; this should be emptied of its contents, plunged into warm water to cleanse it, and then wiped and again applied; but the scarifications should be well sponged or cleansed by means of the soft rag, with warm water, to remove the clots. The others are to be treated in succession in the same way; but if, after the removal once or twice of the glasses, enough blood has not been obtained, the parts should be again scarified.

The great secret of good cupping is rapidity in the application of the glasses, and dexterity in placing them quite flat upon the parts; and as regards the scarification, the cutting *into* and *not quite through* the skin, otherwise the fatty tissue beneath enters into the incisions and blocks them up.

When sufficient blood has been obtained, the patient is to be wiped clean, and the scarified parts covered with square pieces of sticking plaster, snipped along the edges to make them lie flat, in number corresponding to the glasses.

Dry cupping—that is, the application of the cups without scarification or drawing of blood—is oftentimes of service. It removes congestion and relieves pain. The "Exhausting Treatment" is simply dry cupping on a large scale.

VACCINATION.

This is an operation which is well known as a preventive of small-pox.

It will be better that the vaccine matter be taken from the human subject. It is generally obtained from the pustule from six to nine days after the operation; it should be transparent, colorless, or of a very light yellowish tinge. It suffices merely to introduce into the pustule the point of the lancet, upon which it will remain for some time without its qualities being at all impaired. It is sometimes kept between little square bits of glass, or in a fine glass tube hermetically closed at both ends; and when destined to be used at a distant period, it is better preserved by these means. However, when about to be employed, it should be rubbed down with the point of a lancet upon a bit of glass, the point being previously dipped in cold water.

The operation is usually performed upon the upper and outer part of the arm. The operator should lay hold of the back and inner part with the left hand, in order to stretch the skin at the place where he intends to operate; then, the lancet being properly furnished at its point with the matter, and straight open, he inserts it flatwise under the cuticle to the extent of about the eighth of an inch, allowing it to remain there for some instants. Three or four other punctures are to be made in the same manner, with this precaution—that they are to be far enough apart to prevent the red circular patches, which ought to surround them when the matter has taken effect, from touching each other. This precaution is so much the more necessary to be observed in infants, as erysipelas not unfrequently arises from this cause.

It is not necessary, and is sometimes dangerous, to vaccinate infants before the age of six weeks or two months. (For remarks on *Re-vaccination*, see *Vaccination* in latter part of book.)

APPLICATION OF LEECHES.

The best leeches are those of a moderate size, which have never been before applied, which have been but recently taken out of water, and which are vigorous and brisk in their movements.

The first thing to be done is to shave off any hairs that may be present on the parts, washing and sponging these parts well with warm water, and moistening them with a little milk or sugar and water.

In disorders of the eyes they should not be applied immediately upon the lids, but just below the ridge or border which forms the lower part of the orbit; and never, as a general rule, upon the redness of inflamed parts, but as near, however, toward the verge of this as prudently may be.

When they are to be applied over some extent of surface, they should be thrown into a basin of warm water, and then put into a dry square piece of linen, the angles of which are to be drawn up together, so as to form a sort of bag; the warmth thus communicated to them tends to excite them, and render them more apt to bite. Having acquired sufficient energy, which will be seen by the briskness of their movements, the corners of the rag, which rests upon the palm of the hand, are to be thrown back, and the whole reversed upon the part where it is intended they should take. They should be kept in place either by means of a glass applied over rag and all, or merely the hand, which should be stretched out so as only to rest upon the borders. Or they may be placed in the cover of a small pill-box, and applied.

But when they are to be applied upon those parts where they can only be directed one by one, the best plan is to procure a small card, and roll it up so as to leave two openings; the one large enough to admit the whole body, the other very small—just large enough, in short, to give passage to the head; the animal being then introduced, the head downwards, the small end is to be applied to the proper spot, and the other closed by means of the pulp of one of the fingers; when it has adhered, this funnel-shaped card may be loosened and withdrawn, and reconstructed for the rest.

There are three ways of encouraging the bleeding: the first is by the application of a cupping-glass, a method only employed by practitioners; the second by bathing the bleeding orifices, left by the leeches, with warm water; the third by the application of poultices, which are best made of linseed meal.

When leeches are to be applied to the chest, stomach, or bowels, it is advisable to fold a sheet three or four times long-wise, and lay it across the bed, under the patient, before commencing the application of the leeches; during which time a second person should be engaged in preparing a large linseed-meal poultice, to be applied as soon as the leeches have fallen or been taken off. The ends of the folded sheet should then be lifted up, lapped over the whole, and secured with pins; and in this way the soiling of the patient's dress and bed-linen will be totally prevented.

QUACKERY.

I SHALL not attempt to define quackery. The meaning of the word is sufficiently clear, and is well understood.

In our country, quackery of all kinds has been exceedingly popular, and is so at the present time. Its popularity is not confined to the ignorant and uneducated. Many of our best cultured minds —our leading clergymen, lawyers, men of letters, and men of business—prefer quacks for their medical advisers to regularly educated, scientific, and honorable men.

Our *clairvoyants*, our *astrologers*, our *chiromancers*, and all of our ignorant, unscrupulous charlatans and empirics, by whatever name they may be called, are patronized by men who, in other matters, are both intelligent and conscientious.

This inconsistent and wicked conduct on the part of men and women who profess better things may be thus partly explained:

1. *An innate love of being humbugged.*—There are very many in society who delight in humbuggery of all kinds. They dislike whatever is stable, judicious, open, and true, and readily fall in love with whatever is ridiculous, mysterious, secret and false.* With some this love of quackery becomes a disease, and may properly be termed *quackomania.* Such persons, when they leave their homes and go to any large capital for medical advice, usually avoid the scientific and responsible and conscientious physicians, and seek out the most ignorant, the most vulgar, the most degraded, the most unscrupulous charlatans that they can find, and allow themselves to be fleeced of their money, cheated of their health, and perhaps of their lives. Clergymen, and conscientious Christian people of the very best orders of society, who would rather bury a child than allow it to go to a theatre or attend a heretical church, yet intrust the lives of themselves and their children to the vilest criminals that an imperfect legislation ever suffered to roam at large. Men who would never sleep in a hotel where liquor is sold, cheerfully patronize the jail-birds and pickpockets who advertise themselves as physicians and surgeons.

2. *The erroneous impression that quacks are more progressive, more informed, and more successful than regularly educated physicians.*—I admit that the profession has not always been as liberal as could be desired, but the advanced men among us now eagerly seize hold of every *remedy that promises relief* for their patients. They take pains to inquire into all new plans, methods, and systems of cure, even when they are in the hands of comparatively ignorant men. It is a

fact which the people should understand, that nearly all of the progress made in science is made by scientific men, and not by quacks. Quacks simply borrow from the writings and teachings of physicians. They appropriate the ideas of others, call them original, and thus delude the people. Quacks undoubtedly stumble on some excellent methods of treating disease, but the profession *know all that they know, and vastly more.*

The great objection to quacks is, that they are not usually conscientious. People who know nothing of medical science should intrust health and life *only to those who are faithful, reliable, and conscientious, as well as skilful.*

Quackery is not a new delusion. The world has always loved it.

From Pettigrew's work I make the following suggestive extracts:—

"Grose, from a MS. in the Cotton Library (Julius F. 6), tells us that 'between the towns of Alton and Newton, near the foot of Rosberrye Toppinge, there is a well dedicated to St. Oswald.

"'The neighbors have an opinion that a shirt taken off a sick person and thrown into that well will show whether the person will recover or die—for if it floated it denoted the recovery of the party, if it sunk, there remained no hope of their life; and to reward the saint for his intelligence they *tear off a rag of the shirt and leave it hanging on the briers thereabouts*, where,' says the writer, 'I have seen such numbers as might have made a fayre rheme in a papermyll.'

"Fabian Withers, speaking of physicians, declares:—

"'So far are they distant from the true knowledge of physic which are ignorant of astrology, that they ought not rightly to be called physicians, but deceivers; for it hath,' says he, 'been many times experimented and proved, that that which many physicians could not cure or remedy with their greatest and strongest medicines, the astronomer hath brought to pass with one simple herb, by observing the moving of the signs.' The virtues of herbs were considered to be according to the influence of the planet under which they were sown or gathered. Black hellebore was to be plucked, not cut, and this with the right hand, which was then to be covered with a portion of the robe, and secretly conveyed to the left hand. The person gathering it was also to be clad in white, to be barefooted, and to offer a sacrifice of bread and wine. Verbena or vervain was to be gathered at the rising of the dog-star, when neither sun nor moon shone, an expiatory sacifice of fruit and honey having been previously offered to the earth. Hence arose its power to render the possessor invulnerable, to cure fevers, to eradicate poison, and to conciliate friendship. The mistletoe was to be cut with a golden knife, and when the moon should be only six days old."

"A belief in the philosopher's stone lasted for a very long period, and the memory of several eminent men is chargeable with the folly. Lord Bacon speculated upon it, and Sir Isaac Newton is said once to have entertained the possibility of finding it, and also to have acknowledged that the idle and vain pursuit of astrology had led him to cultivate astronomy.

"'The sons of chymistry,' says Lord Bacon, 'while they are busy seeking the hidden gold, whether real or not, have, by turning over and trying, brought much profit and convenience to mankind.'

"It has been remarked as singular, that among the vulgar errors exposed by Sir Thomas Browne in his 'Pseudodoxia Epidemica,' there should be no mention made of the royal gift of healing; but from a case related in the 'Adenochoiradelogiæ,' it would seem that this eccentric but able man (who, it will be recollected, received the honor of knighthood from Charles II.) had himself faith in the touch, inasmuch as he recommended the child of a nonconformist in Norfolk, who had been long under his care without receiving benefit, to be taken to the king, then at Breda or Bruges. Little faith, however, being held by the father of the child as to the efficacy of such intervention, he scorned the advice, and the child was therefore, under the pretence of a change of air, taken without the privity of the father abroad to the king, where it was submitted to the royal touch, and returned perfectly healed. Astonished at the change effected in his child's appearance, the father inquired as to the means that had been employed, and upon being made acquainted with them he not only acquired faith as to the power of the royal touch, but also cast off his nonconformity, exclaiming, 'Farewell to all dissenters and to all nonconformists. If God can put so much virtue into the king's hand so to heal my child, I'll serve that God and that king so long as I live, and with all thankfulness.'

"Professor Woodhouse, in a letter to Dr. Whitehill, of New York, has given a recital, which also tends to show what singular effects can be caused if the imagination be previously and duly prepared for the production of wonders. At the time that nitrous oxide excited almost universal attention, several persons were exceedingly anxious to breathe the gas, and the professor administered to them ten gallons of atmospherical air, in doses of from four to six quarts. Impressed with the idea that they were inhaling the nitrous oxide, quickness of the pulse, dizziness, vertigo, tinnitus aurium, difficulty of breathing, a sensation similar to that of swinging, faintness, weakness of the knees, and nausea, which lasted from six to eight hours, were produced—symptoms entirely caused by the breathing of common air, under the influence of an excited imagination."

In regard to quackery this one fact must be conceded, that there is no method of treatment so *absurd that it may not in some cases perform remarkable cures.*

The story of Perkins's *tractors* is familiar to many now living. Perkins made his tractors of *metal* of different colors, and by touching the patient with them cured many diseases. A physician of England made some tractors of *wood*, resembling those of Perkins in appearance and color. With these he performed the same cure as Perkins had done with his metallic tractors. The delusion was dispelled, and the tractors soon fell into disrepute.

PATENT MEDICINES.

In this country enormous fortunes have been and are now being made by the manufacture and sale of patent medicines. I would not say that for every dollar that has been made by these preparations some valuable life has been sacrificed, but I do say that many of these work most serious harm.

I would not say that all of these preparations are always and necessarily injurious; for it is perfectly well known among physicians that some very simple, and, when used with discrimination, very useful prescriptions are patented under popular titles, and sold in enormous quantities.

Thousands of people are every day buying, at a high price, some combination of drugs, labelled with some euphonious name, which their family physician could give them by a stroke of the pen, or which they themselves might oftentimes obtain of the druggist, or even at the corner grocery.

The great objections to the use of these really useful or harmless patent medicines are these two:—

1. They are given indiscriminately, without regard to the nature of the disease. A wise physician does not usually give medicine until he has some conception of the purpose for which he gives it. A medicine that is in itself harmless in ordinary conditions of the system, may be injurious in some conditions of the system.

2. *To use these medicines is to encourage quackery.* If all people

everywhere refused to buy or to use patent medicines, the health and the morals of society would be much improved.

I need not give any reasons why I object to the use of patent medicines that contain substances that are injurious. The very fact that they contain injurious substances in injurious quantities is all the argument that need be urged against them.

Just here it is proper for me to remark, that the common idea that *vegetable* poisons are less pernicious and fatal than *mineral* poisons is erroneous, and leads to great mischief. This idea arose from the fact that in former times many have been injured by the abuse of mercury in some of its forms. Mercury is indeed a poison, and when abused may work sad havoc with the constitution; but there are very many *vegetable* poisons which are far more speedily, and terribly, and surely fatal than mercury. Prussic acid is a vegetable poison, but it can kill almost instantaneously; *nicotin* of tobacco is a vegetable product, but a drop of it will kill a dog or cat. Strychnine is a vegetable poison, and is so powerful, that when long used as a medicine its effects must be always watched.

Venders of quack medicine have seized hold of this popular prejudice against minerals, and advertise their preparations as containing "no minerals"—as being purely vegetable.

It is proper that their victims should know that many of these statements are utterly false; and even when they are true, when the medicine advertised is of a purely vegetable character, it does not follow that it is harmless.

(For further remarks and illustrations of this subject, see *Hair, Diseases of; Hair Dyes, and Cosmetics.*)

DOSES OF REMEDIES
MENTIONED AND PRESCRIBED IN THIS BOOK.

The doses of the medicines spoken of in this work are for ADULTS.

In order to determine the doses for children of various ages, the following rules of Gaubius are very reliable:

For children	one year old	$\frac{1}{15}$	of the dose	for an	adult.
"	two years "	$\frac{1}{8}$	"	"	"
"	three " "	$\frac{1}{6}$	"	"	"
"	four " "	$\frac{1}{4}$	"	"	"
"	seven " "	$\frac{1}{3}$	"	"	"
"	fourteen "	$\frac{1}{2}$	"	"	"

In giving any of the preparations of opium to children—morphine, or laudanum, or paregoric, or Dover's powder, or cold powder or simple powdered opium, or any prescription that contains opium, the proportionate dose should be even less, because children are much more susceptible to opium than adults.

In all cases it is better to be on the safe side—*to give too little rather than too much.* It is therefore well to *begin* with the smallest dose mentioned and increase it gradually until the full dose is reached.

One teaspoonful	is used for	one fluid	drachm,	or $\frac{1}{8}$	of an ounce.
One tablespoonful	" "	four "	"	" $\frac{1}{2}$	" " "
Two tablespoonfuls	" "	eight "	"	" 1	ounce.
One wine-glassful	" "	two "	ounces.		
One pint	" "	sixteen "	"		

These measures, though not accurate, are sufficiently so for all practical purposes.

For all except the more powerful medicines, 60 *drops or minims are regarded as equal to one fluid drachm, or one teaspoonful.*

APOTHECARY MEASURE.

One scruple (℈) = twenty grains (gr.).
Three " = sixty " or one drachm.
Eight drachms (ʒ) = one ounce.
Twelve ounces (℥) = " pound (℔.).

GENERAL

DESCRIPTION OF THE PRINCIPAL DISEASES,

AND OF THE MOST RECENT

METHODS OF TREATMENT,

IN POPULAR LANGUAGE, ALPHABETICALLY ARRANGED, WITH BRIEF ACCOUNTS OF THE MODERN DISCOVERIES IN MEDICAL SCIENCE.

ABRASION OF THE SKIN.

When the skin has been accidentally ruffled or grazed, the injured part should be carefully washed with tepid water, in order to remove any sand or other impurity from the abraded surface. It should then be bathed with spirit and water until the pain has in some measure subsided.

To protect the part from the air, and prevent inflammation, a piece of folded lint, or soft linen rag, moistened with water, should then be applied, and covered with a piece of oiled silk, to retain the moisture. Glycerine is an excellent application.

Sometimes warm poultices will be found to give more relief than cold applications. The application of strips of adhesive plaster is often perfectly curative.

ABSCESS.

An abscess is a collection of matter, or *pus*, in some part of the body, invariably caused by previous inflammation. Abscesses are generally situated in the cellular structure or tissue, and they form more frequently in that structure near the surface than where it is deep-seated; the same structure or tissue also enters into the formation of all the internal organs liable to abscess.

An abscess is either *acute* or *chronic*.

ACUTE ABSCESS.

When acute inflammation is about to terminate in abscess, the pain, which was previously sharp, becomes dull, the swelling is increased, and throbbing of the part commences. When the matter is completely formed, the part becomes softer, with an uneasy feeling of weight, the throbbing ceases, and, if the matter be not too deeply seated, we may feel it fluctuating by pressing with the fingers. At the same time the feverish symptoms, which existed during the inflammatory stage, lessen, and rigors or shiverings take place at intervals; they are felt principally in the back and loins. The tumor at length begins *to point* at or near the middle of its surface. The skin at this part gradually becomes thinner, ultimately gives way, and the matter is freely discharged.

CHRONIC ABSCESS.

Chronic abscess is frequently situated in the lymphatic glands, as well as in the cellular tissue. It forms slowly. The tumor is round, without redness or heat of skin, and does not offer much resistance when pressed upon. The pain, if any exist, is comparatively slight, but there is an uneasy sensation of tension and weight. After remaining a longer or shorter period in this state, the pain becomes a little increased, a slight degree of redness may be observed on the tumor, and softening commences at its centre, gradually extending throughout. The inflammation then goes on until the skin bursts, and allows the matter to be expelled.

The matter of acute abscess is a bland fluid, thick, white, and without smell. This is called *healthy pus;* but sometimes, when long confined, it becomes thin, fetid, and acquires a grayish color. In chronic abscesses the matter varies in consistence. It is generally serous, containing little flaky or curdy masses, which have in some cases the consistence of cheese, and the smell is disagreeable; this, in contradistinction to the former, is called *unhealthy pus.*

Treatment—Acute Abscess.—When inflammation of a part is going on, threatening abscess, our object must be to prevent this termination, if possible. But, if suppuration cannot be prevented by the usual means—viz. low diet, keeping the bowels freely open, the liberal use of leeches, and the constant application of cold lotions to the part, such as *Goulard water*, vinegar and water, &c.—recourse should then be had to the soothing treatment, which consists of warm applications, as fomentations of marsh-mallow, and large poultices of bread and milk, or linseed; these are to be changed frequently, so as to keep up a due degree of heat and moisture, all stimulating applications being carefully avoided. Internally, the following mixture, recommended by Sir Astley Cooper, should be administered:

Liquor of the acetate of ammonia, six ounces,
Epsom salts, one ounce,
Laudanum, sixty drops. Mix.

The dose of this mixture is three or four table-spoonfuls three times a day. Half a grain of *acetate of morphia* may be substituted for the laudanum.

When the abscess has gone through its stages regularly and begins to *point*, it should be left to burst of itself; but, if the matter be confined under the membrane which envelopes the muscles, or if the skin be very thick and unyielding, it will be necessary to make a free opening with the lancet.

Chronic Abscess.—The treatment of chronic abscess is very different from that of acute. In this case the diet must be generous, and tonic medicine should be administered to give strength to the constitution.

Sulphate of quinine, forty grains.
Extract of gentian, a sufficient quantity to form a mass, to be divided into twenty pills. One to be taken twice or three times a day.

Cold stimulating poultices should be applied over the part. The one generally used is made by dissolving a table-spoonful of common salt in a pint of water, and mixing it with oatmeal or flour. If the case be very tedious, a *compound galbanum plaster* may be applied. This form of abscess will also require the lancet if the matter be deeply seated, or under the muscular covering, so as to prevent its spreading among the muscles; and as a general rule all abscesses, whether acute or chronic, situated in the arm-pit, near the anus, in the groin or neck, should be opened early, in order to prevent the matter from accumulating and extending in the cellular tissue. When it is found necessary to use the lancet, a free opening should be made in the most depending part of the abscess, and a piece of lint smeared with olive oil or spermaceti ointment placed in the wound, to prevent its closing before the cavity has healed up from the bottom.

If the abscess has been extensive, a roller or bandage should be applied, so as to bring the sides of the cavity together without covering the mouth of the wound. Whether the matter has been discharged through an opening made by the lancet, or from the spontaneous bursting of the abscess, it will be necessary to continue the poultices for some time after.

In people of scrofulous constitution, the absorbent glands of the neck not unfrequently become enlarged and hard without being discolored or painful, though there is generally tenderness on pressure. These glandular swellings, for the most part, come on slowly, remain for a considerable length of time, perhaps weeks or months, and occasionally disappear of themselves without any treatment. But in general, after they have continued for some time in this indolent state, matter begins to form, the skin over the enlarged gland acquires a reddish tint, and there is pain either more or less severe. Warm poultices, and sometimes stimulating applications, are then made use of by those who are ignorant of the means which ought to be adopted in such cases; after a time the skin assumes a livid or purplish color, and at last bursts, and the matter is discharged. A considerable portion of the dark-colored skin is lost by sloughing, and an ugly ulcer forms, which is healed with difficulty, leaving an indelible scar which remains for life. In a boy a scar in the neck is kept out of sight, being covered by the dress, and is, therefore, of no great consequence; but to a girl it is of the utmost importance, for when arrived at womanhood it must be a source of deep regret to bear scars not only offensive to the sight, but which point her out as tainted with scrofula, or *king's evil*, a disease that has always been considered as more decidedly hereditary than perhaps any other

Food difficult of digestion, or of a stimulating quality, should not be given, but the diet should be sufficiently nutritious, and not confined to vegetable or farinaceous substances. When a slight blush or degree of redness is observed on the skin covering the part, and when matter can be distinctly felt on pressing with the fingers, vent should be immediately given to it. The opening should be made transversely with a lancet, or a fine double-edged knife, and the greatest care must be taken to squeeze out all the peculiar curdy matter which these abscesses almost invariably contain. By making the wound transversely, it follows the course of the folds or creases of the neck, or runs parallel with them, and consequently when healed the cicatrix will scarcely, if at all, be observed.

After the matter has been discharged, bread poultices mixed with either of the following cold lotions should be applied.

Sulphate of zinc, twenty grains,
Water, ten ounces,
Spirit of wine, half an ounce. Mix. Or,

Nitric acid, twenty drops,
Distilled water or common water, a pint. Mix.

The strength of these lotions must be gradually increased, but not made so strong as to produce pain.

If the wound do not heal readily, which is sometimes the case, the best plan is to inject a little of the following lotion with a syringe every time it is dressed.

Water, a pint,
Sulphate of zinc, twenty to twenty-five grains. Mix.

The time to make the opening, as has been already stated, is when the matter can be felt on pressure with the fingers; the skin covering the tumor will then in all probability have a slight appearance of redness; but if this stage of the abscess has not been taken advantage of, and suppuration has been allowed to go on until the skin has acquired a livid or purple color, the use of the knife will then do no good; it will be better to apply fomentations and warm poultices until the abscess burst of itself.

The time required for the formation of an abscess varies according to its situation and the constitution of the patient. Matter generally begins to form from seven to fourteen days after the commencement of inflammation, and an acute abscess usually runs its course in about three weeks. A lumbar or psoas abscess, or any other extensive chronic abscess, requires a much longer period, sometimes several months. In chronic abscesses the patient will need to be supported by stimulants and tonics and good food.

ABSINTHE, OR WORMWOOD.

This is a plant that grows both in Europe and America. It is, as everybody knows, exceedingly bitter. It is given in *dyspepsia* to increase the appetite and improve the digestion, in *green sickness*, in *jaundice*, and for the expulsion of worms.

The dose of the *powder* is *twenty or thirty grains*; of the infusion, *one or two fluid ounces*.

Absinthe in large quantities is very injurious. Of late years it has been much used in France, in a wine of that name. It works disastrously.

ACONITE (WOLFSBANE OR MONKSHOOD).

The extract is a powerful remedy in all the stages of rheumatism and in gout.. It soothes the excruciating pain arising from cancer and diseases of the womb, when the extract of hemlock ceases to produce that effect. It is of the greatest service in tic-douloureux, scrofulous swellings, old syphilitic diseases, long continued cough, and affections of the stomach.

The symptoms which point out the extent beyond which aconite should not be carried are a slight degree of uneasiness at the stomach, with inclination to vomit, and occasional dimness of sight, which may be removed almost immediately by taking a little warm brandy and water.

Of this medicine both the leaves and the root are used. The plant grows in rocky places. The ancient Gauls dipped their arrows in its juice in order to make them poisonous. It is used in the form of tincture of root, or of leaves.

It is used to reduce the pulse in child-bed fever, in pneumonia, and other fevers. It is useful in neuralgia, in gout, in rheumatism, in diseases of the heart. For neuralgia it is used locally, in the form of ointment of aconitia, or equal parts tincture and chloroform.

The *dose of the tincture* of the root (the best form of it) is *three* drops. It is a remedy which should *usually be given by a skilled physician.*

ÆTHER.

Sulphuric æther is used in nearly all spasmodic diseases, such as asthma, hysterics, hiccough, cramps, and other nervous affections. It is given sometimes as a cordial in low fevers, and also in malignant fevers for the purpose of allaying spasmodic twitchings.

Applied externally, æther stimulates and reddens the skin; it is used for this purpose in nervous headache, and in toothache, being applied to the cheek. To produce the effect of irritating the skin, the part to which it is applied must be kept covered, otherwise it evaporates so quickly as to cause extreme cold.

The dose is from half a teaspoonful to a teaspoonful in a little water, or in three or four ounces of camphorated mixture.

Ætherization.—The power of æther to produce insensibility had been known for many years before its use became popularized. This fact, however, was known only to a few, and attracted no attention.

The first experiments which demonstrated the anæsthetic powers of æther, and forced the public to give them heed, were made by Dr. Morton, a Boston dentist, September 30th, 1846. Before that time, Dr. Wells, of Hartford, had experimented with nitrous oxide, or "laughing gas." The progress of ætherization in this country was at first very slow. Europe went ahead with it much more rapidly than we. It became popular in England, in France, and in Germany, before America—the land of its birth—was willing to receive it. This is another illustration that a prophet is not without honor, except in his own country.

It is now used throughout the civilized world to produce unconsciousness in surgical operations. It is also used in midwifery, and for the relief of neuralgic and other pains.

Except in great emergencies, it should only be administered by a skilful physician. The dose varies with the temperament of the patient, and with the method of administration. Various forms of inhalers have been devised. Usually a sponge is employed. Inhalers that admit atmospheric air at the same time with the vapor of æther are the safest.

Ætherization is also used in *convulsions*, in *locked jaw*, in *hysteric fits*, in *asthma*, in *attacks of madness*, and in painful menstruation. As Dr. John Brown says, "it is one of God's best gifts to his suffering creatures."

As compared with chloroform, æther is much the *safer*. A few deaths have occurred from its use, but only a few, while we know that several hundred have fallen victims to chloroform.

It is much *slower* than chloroform, and its odor is more disagreeable. The present feeling among the profession is to use chloroform less and æther more.

Recently æther has been used to produce *local* anæsthesia. Æther spray is blown on the part which we desire to benumb. The rapid evaporation produces great *cold*. The part becomes benumbed, and slight operations, such as removing a toe-nail, can be performed without pain.

AGUE, OR INTERMITTENT FEVER.

Ague generally declares itself under three regular forms, namely, the *quotidian*, *tertian*, and *quartan*.

The *quotidian* form has an interval of twenty-four hours, and the fit usually commences in the morning. This type of ague is not so common as the other two, and occurs generally in spring.

The *tertian* has an interval of forty-eight hours, the fit occurring about noon. This is the most common form, and prevails also in spring.

The *quartan* has an interval of seventy-two hours, commencing in the afternoon. This form prevails in autumn, and is the most difficult to overcome.

It must not be supposed that these forms of ague commence invariably at certain periods of the day; they may commence at any hour; the periods we have mentioned, however, are the most usual.

Each paroxysm or fit of intermittent fever has three well-marked stages—a *cold*, a *hot*, and a *sweating stage*.

The *cold stage* is ushered in by the following train of symptoms: Languor, listlessness, general uneasiness, with depression of spirits, aversion to food, a feeling of soreness on the back and extremities. The face and extremities then become pale, and a cold sensation is felt in the back and loins, gradually extending over the whole body, until decided shivering takes place; the lips and nails assume a livid hue, the teeth chatter, the skin presents the appearance of what is vulgarly called *goose's skin*, respiration becomes oppressed, the pulse is weak, the mouth and throat dry, all the secretions are diminished, and the patient sometimes vomits.

The *hot stage.*—After a longer or shorter duration, the shaking gradually goes off, the heat of the body returning, until it goes far beyond the natural standard. The skin then becomes dry, the face flushed, the pulse full and hard, the tongue furred, and the breathing, which was considerably affected during the cold stage, becomes easier. There is great thirst, severe headache and restlessness. The urine, which in the first stage was pale, is now high-colored; the sensibility, previously more obtuse than natural, is now increased; the eyes have a bright and glistening appearance, and sometimes delirium comes on.

The *sweating stage.*—The hot stage having continued an indefinite time, a slight degree of moisture is at length observed on the forehead and neck; this gradually extends to the trunk and extremities, and terminates in profuse perspiration, which relieves the patient from his suffering. He is left, it is true, with a feeling of fatigue; but the appetite returns, all the secretions again become natural, and he is able to follow his usual occupation until the commencement of another fit.

The quotidian has the shortest cold stage, but the longest paroxysm or period required for the completion of the three stages; the tertian has a long cold stage, but a short paroxysm; and the quartan has the longest cold stage and the shortest paroxysm.

The usual duration of the quotidian paroxysm is from twelve to fifteen hours, of the tertian ten hours, and the quartan form commonly completes its stages in six or seven hours. These rules, however, admit of many exceptions.

When the disease is giving way, the fits become milder, and gradually later, until at length the ague is no longer felt; but when it is increasing, the fits become more severe, and gradually return earlier, so that it is not unusual for the tertian form to become quotidian, and the quotidian to assume the remittent type of fever.

Causes.—The exciting or specific cause of ague is undoubtedly *malaria*, or the exhalation from decaying vegetable matter. In some parts of Italy, during the excessive heat of summer, the *malaria* becomes so noxious that it causes ague of a pernicious or malignant character, the patient sometimes being carried off in the second or third fit. The most deleterious effects of *malaria*, whether derived from decaying vegetable matter or not, can only be manifested under a high temperature; it then acquires a virulence truly extraordinary. Ague is now supposed to be due to *spores*.

Ague is certainly very apt to relapse, and slight causes, such as exposure to cold and moisture, errors in diet, certain winds, such as the north-east, &c., will bring it back after an absence of months, or even years. Individuals whose general health is not good are more liable to be acted on by *malaria* than those in robust health. Poor diet, fatigue, debauchery, or any other debilitating cause, by enfeebling the powers of life, predispose the body strongly to ague, when exposed to the influence of *malaria.*

Treatment.—In the treatment of ague, we have two objects in view—the one to alleviate and shorten the fits, the other to prevent their return.

Treatment during the fit.—In the *cold stage* it will readily occur to every one to cover the patient with blankets or other warm clothing, and to administer warm drinks. The quantity of bed clothes is to be diminished, and the patient should be allowed to drink freely of cold water or cold acidulated liquids, such as cream of tartar, or tamarind beverage, with the addition of twenty or thirty grains of purified nitre. The cream of tartar beverage is made in the following manner:

To three pints of boiling water, add
Four ounces of refined sugar,
Half an ounce of cream of tartar, and
Three drachms of orange-peel, or an orange cut in slices.

Sweating stage.—In this stage medicine is not requisite. We have merely to take care that the body is not chilled when the patient's clothes are being changed.

Treatment during the intermission.—It is only during the intervals or periods between the fits that we can expect to effect a cure. We then have recourse to *Peruvian bark*, or the *sulphate of quinine*, which are possessed of almost a specific property in preventing the return of the fits, and may be considered as our sheet-anchor in all the forms of ague. The dose of bark in powder is from a drachm to two drachms every three or four hours, so as to allow nearly two ounces to be taken during each intermission. The concentrated form of sulphate of quinine is much preferable, and should be given in the following manner:

Sulphate of quinine, twenty-four grains,
Extract of gentian, a sufficient quantity to make a mass to be formed into twelve pills.

One pill may be given three or four times a day, commencing immediately after the sweating stage, or two grains of quinine may be given in place of each pill, in a little port-wine and water, care being taken to continue this medicine for some time after the disease appears cured. The power possessed by quinine in overcoming ague is truly extraordinary, and must ever be considered as one of the most curious facts in medicine. It does not, however, produce the desired effect in all cases, and, when it fails, we have reason to suspect that the ague is kept up by some organic derangement of the bowels, lungs, liver, spleen, &c. If there be disease of any organ, it is aggravated during the fit, in consequence of the increased determination of blood to the part, causing congestion; and during the intermission the affected organ keeps up constantly a greater or less degree of irritation in the system, and thereby prevents the quinine acting as it otherwise would do.

In such cases, when quinine is obstinately resisted, the *arsenical solution*, or *Fowler's solution*, which is the most powerful antiperiodic remedy we possess, next to quinine, may be found of the greatest advantage. The dose to commence with should be as follows:

Fowler's solution of arsenic, three drops,
Laudanum, eight or ten drops,
Water, an ounce. Mix. To be given every four or six hours, gradually increasing the dose of the solution to eight or ten drops, according as the stomach will bear it.

It should not be given before breakfast, or on an empty stomach. If carefully watched, there is no danger whatever in using the arsenical solution, and it frequently cures ague when quinine fails. If it produce griping of the bowels or sickness at stomach the dose should be diminished.

The bowels must never be allowed to remain constipated at any period of the disease.

Purging to any extent is never necessary in ague. Keeping the bowels gently open is sufficient.

It is only during the intermission that food should be taken, and, as ague is almost invariably attended with debility, the diet ought to be light, nourishing, and of sufficient quantity.

General electrization has been found very efficacious in the chronic exhaustion resulting from ague. (See *General Electrization.*)

ALOES.

This medicine is an excellent purgative, and one of the most certain in its action we possess. It does not produce watery stools nor create wind in the bowels, rarely disagrees with the stomach, and when taken in small doses assists digestion. It is particularly useful in cases of habitual costiveness in connection with indigestion, and answers well with hypochondriacal people, and those of sedentary habits; it is also serviceable when the constitution is sluggish or scrofulous. Aloes, when combined with myrrh and a preparation of iron, is beneficial in obstruction of the menses, and when given in conjunction with small doses of blue-pill has been found one of the best medicines in jaundice.

It acts principally on the lower intestines, and has a tendency to irritate them when given too frequently or in too large doses. Hence it ought not to be given to those who have piles, nor when there is inflammation of the bowels, and should be particularly avoided by females who are subject to immoderate flowing of the menses. It is improper when there is any disease of the womb, during pregnancy, and also during the period of the menstrual discharge. Aloes is usually given in the form of pills; the dose is from five to fifteen grains; it is, however, seldom taken alone. When intended to give tone to the digestive organs and also to open the bowels, the following form of combination, recommended by Professor A. T. Thompson, will be found one of the best:

Take of myrrh, six drachms,
Subcarbonate of soda, three ounces,
Ammonia, four drachms and a half,
Extract of aloes, six drachms,
Sherry wine, twenty-four ounces. Macerate during seven days, and strain.

Two or three tablespoonfuls of this mixture to be taken twice a day in the same quantity of a solution of extract of liquorice (the common Spanish liquorice dissolved in warm water), which answers the purpose of concealing the taste of bitter medicines better than anything else.

ALUM

was formerly employed in internal bleeding and gleet, but is now very little used internally. It has been found useful in stopping the bleeding from leech bites in children, by keeping a portion for some time applied to the parts, and may be used in the same way to stop the bleeding arising from the extraction of a tooth. It is serviceable as a wash in arresting bleeding from the nose. Alum, also, forms a very useful gargle in common sore-throats.

In the following form it is found beneficial as an injection in the discharge called *the whites:*

Take of alum, a drachm,
Water, seven ounces. Mix.

It is often used as a lotion for the eyes, after the inflammatory stage of ophthalmia has been subdued.

Take of alum, ten grains to a scruple,
Rose water, six ounces. Mix.

AMAUROSIS.

When there was no means of examining the bottom of the eye, where the nerve enters from the brain, all defects in vision, which could not be traced to some external cause, were placed under the head of amaurosis. Since the invention of the ophthalmoscope—which is simply a reflector, by means of which light can be thrown from a lamp or other source of illumination upon the retina and nerve of the eye, thus allowing these parts to be plainly seen (see *Ophthalmoscope*)—when we speak of amaurosis we mean certain diseases of the optic nerve and retina which can only be certainly recognized by means of this instrument. These affections are usually incurable, and result from inflammations of the brain, of the nerve itself, from the bursting of an artery within the eye, the plugging up of a blood-vessel, or similar causes. They are not as common as they were formerly supposed to be. They were at one time confounded with affections of the eyeball that only required the proper use of spectacles. No one but a person medically educated is competent to decide that an affection of the eye is amaurosis.

ANÆMIA.

Anæmia means poverty of blood.

It is caused by *hemorrhage, by exhausting diseases, by blood-poisons, and by confinement indoor.*

The symptoms are *paleness, debility, nervousness,* nervous *palpitation of the heart.*

This disease is very apt to be confounded with what I call *neurasthenia* or *chlorosis*, which are nervous diseases. Anæmia is a disease of the blood, neurasthenia of the nervous system. One may cause the other. They are often associated. Both are liable to occur in young girls, or boys about the age of puberty.

The *treatment of anæmia* is important, for the disease may give rise to *neuralgia,* and other and nameless shapes of nervous disease.

1. *Iron, quinine, and strychine,* in the form of elixir of the pyrophosphate of iron, quinine, strychnine.

2. *General electrization.*—I continually use this method of treatment of anæmia, and with good results. It is especially useful for those cases that are associated with chlorosis (green sickness) or nervous exhaustion.

It often succeeds in these cases after internal tonics have failed. It may be used in connection with other tonics. My own habit is to treat anæmic and exhausted patients by general electrization alone for some time, and when they have abandoned treatment to give them a prescription of the elixir spoken of above.

3. *Air, sunlight, and exercise.*—I mean to improve every opportunity to speak a good word for these three great physicians, even at the risk of frequent repetition.

4. *Abundant and nourishing food.*—Anæmic patients need plenty of meat, beef-tea, fresh eggs, and bread.

5. *Plenty of sleep.*—Sleep can only be expected by those who obey the laws of health. Sleep is food for the blood, as well as for the nerves.

ANGINA PECTORIS, OR BREAST-PANG.

This is an intermittent affection, coming on in fits at irregular intervals, and is one of the most painful and most fatal of all diseases. The fit commences suddenly, and usually when the patient is walking, with a severe lancinating or stabbing pain, generally behind the lower part of the breast-bone. extending in the direction of the left nipple. The constrictive suffocating sensation which accompanies the pain compels the patient to stop, and in the course of a few minutes, if quiet be observed, the attack goes off. The first attacks are comparatively slight and of short duration, no particular inconvenience being felt when they are over; but after a time they become more severe, and continue much longer; the pain extending to the arm, and even to the ends of the fingers, generally on the left side only, though sometimes it extends to both, accompanied with a feeling of numbness, which prevents the use of the arm. Occasionally the neck, the left jaw, and even the ear, are affected, the speech being slightly impeded; and the anxiety and suffocating sensation are frequently so severe, that the patient dreads immediate death. When the disease has advanced to this extent, the fits last from half an hour to an hour, or even longer. The respiration is usually very little affected, though it may be sometimes a little more frequent than natural. The pulse is in some cases natural; in others quick, strong, irregular, or intermitting. The face may be either pale or red; sometimes pale, or with a sallow tinge. The skin may be hot, or covered with a cold, clammy sweat.

After the termination of a severe attack the patient experiences a feeling of fatigue and soreness of the parts affected, and the sensation of numbness frequently continues for a considerable length of time.

TREATMENT OF ANGINA PECTORIS.

The treatment of this affection is not very satisfactory. It is difficult at the outset to determine whether we have or have not the disease. It is still more difficult to tell what the cause is. The disease may depend on a variety of causes.

For treatment we can, as a rule, only relieve. We can palliate, and make more comfortable.

Electrization has been found of service in this day by Duchenne, of France, and by my associate, Dr. Rockwell. The results, however, have by no means been satisfactory.

Those who suspect that they have this or any other affection of the heart should consult some medical authority and have their doubts confirmed or dispelled. (See *Heart, Diseases of.*)

APOPLEXY.

Apoplexy is characterized by a sudden suspension, more or less complete, of the power of sense and motion, the organic functions of circulation and respiration continuing to be performed, though impaired to a certain extent.

This disease is caused by pressure on the brain from an effusion of blood, its symptoms varying according to the extent of the effusion.

There are certain symptoms which sometimes give notice of the approach of apoplexy, namely, giddiness, indistinct vision, with the appearance of motes or sparks before the eyes, buzzing or ringing in the ears, drowsiness, a sensation of fulness in the head, general headache, or a pain in some particular part of the head, inability to articulate distinctly or to walk firmly. But in the majority of cases people are struck with apoplexy when to all appearance in excellent health, and without any indications of the approach of this dreadful disease.

This disease may be mistaken for a *fainting fit*, though the distinction is sufficiently well marked. When a person faints, the face and lips lose their color, and the skin becomes cold. In apoplexy, on the contrary, the face is generally red and the skin hot. In fainting, the pulse and respiration are almost suspended. This is not the case in apoplexy. A fainting fit is but of short duration, and the individual on recovering does not experience pain.

Epilepsy, or the falling sickness, resembles apoplexy in so far as the individual in both cases falls down in a fit; but in the former disease there are convulsions, the limbs are not paralyzed, but rigid, and the eyes are convulsed and look upwards; these symptoms distinguish it sufficiently from apoplexy. (See *Epilepsy.*)

Complete intoxication is distinguished from apoplexy by the smell of the liquor which the individual has drunk, and by the weakness of the pulse.

This disease is undoubtedly on the increase among us. It is certainly very common.

The great cause is over-work and over-worry of the brain. High living is not so much the cause as is commonly supposed. It comes on most frequently at night and after dinner. Intemperance causes it. It is most frequent after the age of fifty, but is now quite common between 30 and 50.

The country has been recently startled by the sudden death, by apoplexy, of Mr. Henry J. Raymond. As usual in such cases, various and opposite causes are assigned for the sudden and fatal attack.

Nothing is more difficult than to determine in any given case of apoplexy, or indeed of any affection of the nervous system, *the precise cause* of the calamity. In the majority of cases these maladies are the results of *many* injurious causes acting upon the system perhaps for years.

In Mr. Raymond's case excessive labor was probably one of the principal causes, and yet many die of apoplexy who have never *overworked, and who have been very regular in all their habits.*

TREATMENT OF APOPLEXY.

1. *Rest.* Let them alone. Bleeding usually does more harm than good.

In the majority of cases a patient taken with apoplexy needs at first only careful and judicious *nursing.* The head should be kept raised, and cool cloths should be put on the head.

2. *Mustard plasters* to the calves of the legs and back of the neck. These have the effect to draw the blood from the head.

3. *Strong purgatives.* A drop or two of croton oil on the tongue, a good dose of jalap or podophyllin, or any other powerful purgative, will answer the purpose.

Apoplexy often leaves a patient paralyzed in one half the body. This paralysis is best treated by general or localized *electrization and rubbing with the hand.*

Concerning this affection, Prof. Austin Flint thus advises:

" The liability to a recurrence of apoplexy after recovery from an attack renders it important to observe all possible precautions by way of prophylaxis. Placing the system in the best possible condition by means of a well-regulated diet and regimen, and avoiding exciting causes, will afford all the security which can be obtained. It is not probable that any protection is afforded by reducing the powers of the system, and other evils may thereby be induced. It is injudicious to adopt a diet which is insufficient for the wants of the system, or to resort to repeated blood-lettings, cathartics, or other lowering measures. In striving to avoid excesses and imprudences of all kinds, care must be taken not to err in the opposite extreme. Mental occupation within certain limits is advisable.

"The liability to apoplexy, if an attack have never occurred, cannot be estimated with any degree of certainty. This is one of the affections which persons are apt to apprehend; and if certain cerebral symptoms are experienced, especially vertigo, the fear of apoplexy is often a source of much unhappiness. The suggestion by the physician that there is danger of this affection is an indiscretion which I have known to prove most calamitous. When apprehension is felt, the physician is warranted in giving assurances that vertigo and other cerebral symptoms are sufficiently common without being followed by apoplexy, and that an apoplectic attack is rarely preceded by obvious premonitions. Needless uneasiness may oftentimes be removed by these assurances."

APHASIA.

This is a disease that has recently attracted considerable attention. It signifies a lack of the power of speech. The difficulty is sometimes so severe that the patient can only say "yes" and "no." He cannot say the word that he desires to say. Memory fails, as well as power of speech. This affection sometimes occurs after an attack of apoplexy. It is an affection of a very grave character. It is always a result of some injury of the brain. It is now believed by many that in *aphasia* the posterior lobe of the third convolution is injured.

APHONIA. (See *Larynx*, *Diseases of.*)

APHTHÆ, OR THRUSH.

This is a very common complaint amongst children, and almost invariably arises from a disordered condition of the stomach and digestive organs. It is sometimes caused by improper diet in children brought up by the hand, or by milk of a bad quality from an unhealthy nurse, or one who is immoral or intemperate in her habits.

Symptoms.—When this complaint is of a mild character, the general system is not much disturbed; there is commonly an increased degree of redness on the inside of the mouth and about the tongue, and these parts are covered with specks or patches resembling curdled milk. But in more severe cases these whitish-looking flakes extend to the back parts of the throat, and even down into the gullet. The child is fretful, an increased degree of slavering and hesitation in sucking may be observed, and the mouth is hot and tender. The little patient now becomes slightly feverish, although this symptom is not always present, is sick at stomach, drowsy, and starts in its sleep, as if frightened or suffering pain. In all cases there is acidity of the stomach, while the breath, and the coagulated milk which is vomited up, have a sour smell; the bowels are also affected, the stools being watery, and of a green color, with considerable griping. Sometimes the *anus* becomes excoriated by these acrid evacuations, which are discharged so frequently as greatly to distress the child, who now becomes pale and loses flesh. Thrush generally lasts eight or ten days, but is not dangerous unless in some cases where the white flakes or crusts fall off, leaving the surface of a brown or bluish color, followed by a bad kind of ulceration of the parts. When this occurs the purging is very severe, and the stools have a slimy appearance.

Thrush is not contagious, and is generally observed in weak children, or when the mother's milk is of a bad quality.

Treatment.—If there be no purging at the commencement of this affection, the stools will generally be found of a green color; and as there is always acid in the stomach and bowels, one of the best remedies is *magnesia* in small doses, repeated from time to time until the bowels are freely opened. One of the best local applications is *finely-powdered borax*, mixed with an equal quantity of sugar, and placed upon the tongue, which, by its natural movements, will soon carry the powder to every part of the mouth. This should be repeated every two or three hours, or the honey of borax may be applied to the affected parts of the mouth with a camel's hair pencil. In mild cases no other treatment will be required.

If the evacuations from the bowels still retain a green color, and if there be little or no purging, equal parts of *lime-water and milk* will be found useful. A tablespoonful of this mixture may be given four or five times a day. If there be thin watery stools, with griping and straining, a teaspoonful of the following mixture may be given every two hours until the child is quieted:—

Magnesia, twelve grains,
Laudanum, three drops,
Water, one ounce,
With a sufficient quantity of sugar to make it palatable.

Weak solutions of chlorate of potash will be useful. The child may swallow a little of solution.

To aid in relieving the irritation of the bowels, the little patient should be placed from five to ten minutes in a bath of about eighty degrees of Fahrenheit's thermometer, and then well dried and wrapped up warmly.

During the continuance of this complaint the mother's diet should be carefully regulated, so as to prevent acidity at stomach, and should be of such a nature as to ensure the purity of her milk. Plain animal food, with bread or rice, is the most suitable kind of diet; no vegetables which will induce acidity upon the stomach should be taken, and water should be the only beverage at dinner.

Thrush generally occurs before the child is weaned, and then the mother's milk is the only nourishment that should be allowed. But if the child has been weaned before the complaint makes its appearance, the diet should consist of chicken broth, or weak beef-tea; lime-water with milk, or gum-water made by mixing gum arabic with warm water. But, although there is generally considerable thirst, children seldom have much appetite for food during the progress of thrush.

Rubbing the inside of the child's mouth with a rough cloth or a piece of flannel is a barbarous custom.

As long as the complaint continues the greatest attention should be paid to cleanliness; the lower extremity of the bowels and the hips should be washed with tepid water, or milk and water, after every evacuation, and then, if there be any excoriation or abrasion of the skin, the parts should be anointed with fine soft pomatum or glycerine.

ARNICA.

This, in the form of tincture, is very much used as a liniment. It may be combined with other substances. For applications to sprains it is one of our most valued remedies. It is supposed to produce absorption. On this theory it is sometimes given internally in apoplexy, in order to cause the absorption of the clot of blood in the brain.

ARSENIC.

The ARSENICAL SOLUTION, commonly called *Fowler's Solution*, is the only preparation of arsenic used internally. It is seldom given until other medicines fail, and then, when conducted with due caution, is as safe as many other remedies in every-day use, such as prussic acid, morphine, strychnine, &c. When the sulphate of quinine does not produce the desired effect, this is the most powerful remedy we possess in curing the ague. (See *Ague.*)

This remedy is of the greatest service in some cases of the remittent fever of warm climates, when no local inflammation could be discovered; and, indeed, in this, as well as in many other diseases of a periodic nature, such as periodic headache, rheumatic pains coming on at certain hours, and rheumatic affections of the eyes, it is a valuable medicine, and should never be lost sight of when quinine and preparations of iron have been tried without success.

This solution has been used advantageously in many nervous affections, such as epilepsy, St. Vitus's dance, catalepsy (or trance), and *tic-douloureux.* Good effects have resulted from its use in some *diseases of the skin*, also in cancer; and it is the most efficacious remedy in the treatment of elephantiasis (or *Barbadoes leg*).

The dose of the arsenical solution is four to six drops, with six or eight drops of laudanum to each dose, twice a day. The proper time for taking it is about half an hour after eating. When given in this manner no bad effect will result; in larger doses (twelve or fifteen drops) it sometimes causes a little griping and sickness at the stomach, which may be removed by giving a small quantity of laudanum (fifteen or twenty drops). When these symptoms come on the dose should be diminished.

Arsenic has been used externally in cases of cancer and inveterate ulcers, but in this manner is attended with considerable risk; indeed, it has been known to find its way into the system by absorption, and cause death. It has been the means of curing many obstinate ulcers of the lips and face, but in some cases, when applied externally, has caused the most intolerable pain. We can only use this remedy with safety internally. *Arsenic enters into the composition of several dangerous quack medicines.* It is a tonic of decided power.

ASSAFŒTIDA.

This medicine is principally used as an antispasmodic in doses of five grains to twenty. It is useful in allaying inordinate muscular action in asthma, hooping-cough, colic, and hysterical affections; and is given to promote expectoration in long-continued coughs, particularly in those of old people with debilitated constitutions. When there is any inflammatory action going on it ought not to be administered, on account of its stimulating and heating properties. In flatulent colic it is often of the greatest service when given as a clyster; when used in this manner, a drachm to two drachms should be dissolved in a pint of warm milk or linseed tea.

The action of the *tincture of assafœtida* is quicker than that of the gum, and should be given in the quantity of one or two drachms.

ASTHMA.

It is generally unaccompanied with fever, and is characterized by great difficulty in breathing, recurring in fits at irregular intervals, attended with a feeling of constriction in the chest, wheezing, and a difficult cough, terminating in expectoration.

There are certain symptoms which give notice of the approach of a fit of asthma, particularly if the individual has been subject to it for some time; viz., a sensation of oppression and fulness at the pit of the stomach, eructation of air, headache, sickness, disturbed rest, and not unfrequently an increased flow of pale urine; they are, however, by no means regular, and in some cases are entirely wanting.

The fits usually come on between eleven o'clock at night and two o'clock in the morning. The patient awakes suddenly with great difficulty of breathing, and a most distressing sensation of tightness and constriction about the chest, which compels him to sit up in bed: he raises his shoulders, throws back his head and elbows, and uses every means in his power to expand his chest; he breathes with a wheezing noise, which may be heard at some distance, and coughs occasionally, but with considerable difficulty; and though he can scarcely speak, he requests the windows to be opened, that he may breathe fresh air. The face sometimes remains pale, but in general becomes red, or acquires a bloated appearance; the eyes also appear red and prominent, and the face and breast are covered with sweat. The pulse is quick, weak, and not unfrequently irregular or intermittent; the hands and feet are cold, and in some cases, when the fit is very severe, the patient vomits frothy, bilious-looking matter.

The fit having continued two or three hours, or even longer, terminates with cough and expectoration, either more or less profuse, and the exhausted patient falls asleep. When any one has once suffered from a paroxysm of asthma, he may be almost certain that it will recur at intervals of longer or shorter duration.

When asthma is purely spasmodic, uncomplicated with any other disease, the individual, after the fit is over, recovers his breathing entirely, and suffers no inconvenience until the recurrence of another attack. True, spasmodic asthma, not associated with other diseases, is not common, yet it does occur; and we have the best of evidence that individuals have died during the fit, and on opening the body not a trace of disease has been found. In the great majority of cases, however, the breathing during the intervals is either more or less affected, and symptoms of the morbid changes, which have either caused the disease or resulted from it, may be easily traced.

Exciting causes.—The exciting causes which have an immediate tendency to bring on fits of asthma are very numerous, the principal of which are, errors in diet, particularly if attended by acidity at stomach or *heartburn;* excess in drinking wine and spirits; distention of the stomach from an accumulation of wind; exposure to cold, moist air, or too dry an atmosphere; suppressed perspiration of the lower extremities, caused by sitting with cold or wet feet, sudden changes of weather, certain winds, and indeed all the causes which bring on cold or catarrh of the *bronchi* or air-passages; sudden mental emotions, as anger, terror, surprise, &c.; loud, or too long speaking; certain occupations of artisans, which expose them to an atmosphere charged with dust; irritating gases, metallic fumes, or minute particles of cotton, wool, fur, and metal. In some people exhalations from the vegetable kingdom, as the effluvia from ipecacuanha, from hay, or from grass in flower, will induce an attack of asthma. (See *Hay Fever.*) Some suffer least in flat countries and in large towns, pure mountain air being almost insupportable to them; others, again, are rendered miserable by the smoky atmosphere of a large town.

TREATMENT OF ASTHMA.

First. To relieve the attacks.—This is done in various ways.

1. The following prescription may be tried:

Wine of ipecac,
Tincture of lobelia, equal parts,
Half a teaspoonful every half hour.

2. Tincture of henbane sometimes does good.
3. Hoffman's anodyne in the ordinary doses may be tried.
4. Smoking tobacco, or smoking cigarettes of stramonium.
5. Burning paper soaked in saltpetre and breathing the air.
6. Mustard plasters and dry cupping between the shoulders.
7. Hot foot-baths.
8. Inhaling oxygen. It is well for each patient to try all these remedies in order, until he hits on the one that best answers his purpose. What will help one may injure another.

One remedy may lose its efficacy in time; then it is necessary to try something else.

Secondly. Treatment in the intervals.—Asthmatic patients generally need tonic remedies.

Among the tonics that are found most useful are:

Iodide of potassium,
Arsenic (Fowler's solution), very small doses—5 to 10 drops in water, after meals,
The elixirs of quinine, pyrophosphate of iron, and strychnine,
Nitro-muriatic acid,
Phosphoric acid,
Bromide of potassium,
General electrization.

All of these remedies may be tried until benefit is received; *for all of them* have in some cases done good, and again all of them have failed. There is no specific for asthma. Although the bromide of potassium and electrization are placed last, it is not because they are of least service. It may be well to try them first, and the other remedies subsequently. Asthmatic patients are very capricious. Some are benefited by going to the sea-shore, others by going to the interior. Some can sleep better on the first floor, others in the upper stories.

I knew an asthmatic patient in whom the odor of buckwheat cakes would bring on an attack immediately. If he entered the front door of a house when they were cooking buckwheat cakes in the kitchen, he would sometimes be thrown into a violent paroxysm.

Asthmatic patients have these consolations. They rarely die during an attack. They will usually live to a good old age.

Prof. Flint has the following very judicious remarks on this subject:

"During the paroxysm the objects of treatment are to lessen the suffering and bring the paroxysm to an end as speedily as possible. The measures for these objects have reference to spasm as the essential pathological condition. The measures to relieve spasm are various, each of which proves efficacious in some cases and not in others. Frequently the past experience of the patient is the best guide as to the particular measure which will be most likely to afford relief. In cases of asthma unaccompanied by bronchitis, I have known a full opiate quickly and completely successful; but, in the larger proportion of cases, it will not succeed in cutting short the paroxysm, nor afford marked relief. Of other narcotics, stramonium is best suited to this affection. The usual mode of administration is to smoke the dried leaves or fibres of the root either in a pipe or prepared as a cigarette. It is undoubtedly true that this measure in some persons acts like a charm, and may be confidently relied upon as a prompt and effectual mode of obtaining relief; but in the majority of cases it either produces no effect, or merely mitigates the severity of the paroxysm. Assafœtida, dracontium or skunk-cabbage, and the Indian hemp have been found to be sometimes efficacious. The ethers, given internally, are to some extent useful as palliatives, and occasionally produce complete relief.

"Marked relief is frequently obtained, and the paroxysm is sometimes cut short, by nauseant remedies, viz.: antimony, ipecacuanha, lobelia inflata, and common tobacco. The two remedies last named are especially efficacious in a certain proportion of cases. The common tobacco will be more likely to be successful if the patient be not accustomed to its use. With a view to the relief of spasm, these remedies need not be carried to the extent of producing vomiting; if not effectual when nausea is induced, it will be useless, if not injurious, to push them further. I have known a paroxysm to be arrested at once by blood-letting, but this is a measure too potent to be employed except occasionally in plethoric persons.

"The inhalation of the vapor of chloroform or ether is a measure of great value in the treatment of asthma. Not unfrequently the paroxysms are completely controlled by it, the patient passing, in the space of a few moments, from a condition of great suffering into one of ease and comfort. These cases are among those which afford the most striking examples of the resources of practical medicine. The dry bronchial rales which, before the inhalation, were loud and universally diffused over the chest, sometimes disappear as soon as complete relief is procured by the inhalation, a fact proving conclusively the existence and cessation of spasms. Unhappily this measure, like the others, is only efficacious in a certain proportion of cases. It should be tried always, provided there are no circumstances to contra-indicate it. Its employment should never be intrusted to the hands of the patient.

"It is hardly necessary to say that if there be ground to suppose the attack to have been brought on by overloading the stomach or by constipation, an emetic or cathartic is indicated. And, of course, the patient is to be removed from the action of any known exciting cause, such as the emanations from hay, feathers, etc. The apartment should be large, high, and airy. Warm and stimulating pediluvia are useful as palliatives. Strong coffee, taken hot, is generally highly useful as a palliative. Another palliative measure, which sometimes proves to be curative, is to be added. This consists in diffusing throughout the apartment the fumes of burning nitre-paper; that is, bibulous paper dipped in a saturated solution of the nitrate of potassa, and dried. Some patients find great relief, and occasionally the paroxysms are arrested by this measure."

The manner of living and habits of people affected with asthma are generally such that they can have very little chance of getting rid of the disease. Indeed they too frequently adopt the most direct means to prolong their suffering. Knowing their liability to catch cold, and being well aware that a cold or catarrh is generally the prelude to a fit of asthma, they (at least those who have it in their power) shut themselves up in close rooms on the approach of winter, dreading the slightest exposure to cold air. They deprive themselves of exercise, and in consequence indigestion is brought on, the general health is impaired, and life becomes almost a burden. If they do occasionally venture into the open air they return to the same overheated atmosphere or sit near a large fire, not taking into consideration that by far the most common cause of cold is *the sudden change from cold air to an overheated room.* The patient blames the cold air, but the fact is the lungs bear cold well, or an equal temperature, whether cold or hot.

More dependence should be placed in proper regimen than medicine in this disease. Regular exercise in the open air, either on foot or horseback, is absolutely necessary in all seasons, and the means of next importance is cold bathing. In winter the patient should sponge his body every morning, on getting out of bed, with salt water (two tablespoonfuls of salt to each pint of water), rubbing the body well after the ablution with rough towels. The water used should at first be tepid, and then gradually colder until the patient can bear it perfectly cold. In summer, bathing in the sea or the cold shower-bath will be preferable. Cold ablution in winter tends more than anything else to do away with the susceptibility to cold which exists in the catarrhal forms of asthma. After using it regularly for some time, exercise in the open air can not only be taken in winter with impunity, but with the greatest advantage.

ATROPINE.

This is the alkaloid principle of *belladonna.* It is a remedy of great power, and must be used with caution. It is now employed in subcutaneous injections. (See *Hypodermic Injections.*) It is used in the treatment of diseases of the eye. Its administration should only be intrusted to those who are exceedingly vigilant and careful. Atropine is our best *antidote* to *opium poisoning.*

Dose of sulphate of atropine is from *one-fiftieth* to *one-twentieth* of a grain. When injected beneath the skin a less dose is required —from $\frac{1}{200}$ to one-fiftieth of a grain. For the purposes of subcutaneous injection it may be combined with morphine They are antidote to each other. Atropine causes dilatation of the pupil, dryness of the mouth, and sometimes giddiness.

AUSCULTATION, OR SOUNDING THE CHEST.

This method of studying diseases of the chest was discovered by Laennec in 1816. Laennec himself died of consumption, in the forty-fifth year of his age.

In auscultation the ear of the physician is applied directly to the chest, or to an instrument called a stethoscope, placed against the chest of the patient, through which the sounds are transmitted. (See *Stethoscope.*)

This method of examining the chest has wrought a great change in the study of diseases of the *heart* and *lungs.* Physicians now rarely attempt to give a positive opinion in any case of suspected disease of the heart or the lungs, without using this method of examination.

The skill and facility that can be obtained in this art by long practice is wonderful.

For those physicians who thoroughly understand it, and who have enjoyed good opportunities for practice in the art, this method of diagnosis is very reliable, and far more satisfactory than the mere study of the general symptoms of the patient.

Auscultation and percussion (see *Percussion*) together are often sufficient to settle the important question whether a patient is or is not suffering from disease of the heart or lungs, and also to determine the stage of the disease. The subject itself is wide enough to occupy a lifetime.

Auscultation has been sometimes resorted to in order to determine the condition of the intestines, and is also used to detect the beatings of the fœtal heart.

BACK-ACHE.

Back-ache is a *symptom* of numberless diseases. It is only very rarely the symptom of disease of the spine, or of the spinal cord, or of the kidneys. In order to ascertain what disease it betokens, it must be studied in connection with other symptoms. In the majority of cases it is a symptom of nervous exhaustion. Pain in the "small of the back" is a frequent complaint of dyspeptics. Women often suffer from pain in the lower portion of the back, at the foot of the spine. Difficulties of the womb oftentimes make themselves felt in the back. Whenever a person gets run down from any cause or causes, back-ache is liable to appear. In such cases the aching is done by the *nerves that* *issue from the spine.* Such nervous pains I have called *headache in the back.* They come on in the afternoon, or when we are specially wearied. They come when we sit too long, or when we stand too long, or when we lie down too long. They may trouble us even at night.

Back-ache, then, may be a symptom of all these and many other different conditions:

Nervous exhaustion.
Dyspepsia, or derangement of the digestive organs.
Diseases of the genital organs.
Diseases of the spine and spinal cord.
Diseases of the kidneys.

The two first-named are, in the great majority of cases, the causes of *back-ache.*

Besides these *chronic* conditions, it is well known that most of the principal *fevers—yellow fever*, *remittent fever*, *intermittent*, *small-pox*, *&c.—are ushered in by pain in the back.*

Treatment.—The treatment is to treat the *cause.* Cure that, and the symptom will disappear. Great relief may be obtained by *anodyne plasters.* My preference is for those made of *belladonna.*

BARBER'S ITCH. (See *Skin*, *Diseases of.*)

BENZOIN.

This is the juice of a tree that grows in Sumatra. It is used chiefly in the form of *benzoic acid* and *compound tincture.* The acid is given for the purpose of diminishing the formation of *uric acid* calculus.

The compound tincture is applied to sore nipples of nursing women with great success. A mixture of compound *tincture of benzoin* and *glycerine* is one of the very best remedies for chapped hands. It is used also for the removal of freckles, and in various diseases of the skin.

Dose.—Benzoin or benzoic acid may be given in doses of from 5 *to* 30 *grains.*

BISMUTH.

The subnitrate of bismuth is an excellent antispasmodic and sedative. It is a valuable remedy in chronic affections of the stomach, and very efficacious in checking vomiting. In cases of indigestion, attended with heartburn and pain at the stomach after eating, I have known it produce the best effects when combined with the extract of henbane, in the following form:

Take of subnitrate of bismuth, thirty grains,
Extract of henbane, the same quantity. Mix, and divide into twelve pills. One to be taken in the morning, one in the middle of the day, and two at bed-time.

This treatment, with low diet and abstinence from everything stimulating, is to be continued during a week or ten days.

Some practitioners prefer combining it with rhubarb and magnesia.

Take of subnitrate of bismuth, two or three grains,
Rhubarb, two grains,
Magnesia, five grains. Mix.
To be given as a dose, and repeated twice or thrice in the course of the day.

Bismuth does not dissolve in water, and, if not given in the form of pills, should be mixed with a little jelly, honey, or any other convenient vehicle.

Subnitrate of bismuth was popularized in France by the late Trousseau. It is now very much used in *dyspepsia*, in *chronic diarrhœa*, in *heartburn, and pains in the stomach.* In spasms of the stomach and in water-brash it has been of service. Powdered bismuth is used externally for burns, tetter, bed-sores, and ulcers. It is combined with *pepsin*, and given with good results in the *diarrhœa of infancy.*

Dose.—This is a safe remedy, and may be given in large or small doses. The dose ranges between two or three grains for infants to one drachm for adults.

Subcarbonate of bismuth is sometimes substituted for the subnitrate. It does not constipate the bowels as much as the subnitrate, and neutralizes the acids of the stomach better.

BLADDER, INFLAMMATION OF.

The symptoms which characterize acute inflammation of the bladder are heat, tension, and pain more or less severe at the lower part of the belly, which is increased on pressing with the hand over the bladder, or by sneezing, coughing, going to stool, or by any movement of the body. There is great and frequent desire to void the urine, which is high-colored, and passed in a few drops at a time with much pain and difficulty, and sometimes it cannot be discharged at all. As the disease advances, the lower part of the belly appears swollen, in consequence of the space which is taken up by the bladder distended with urine. The slightest pressure there is then insupportable, and the whole abdomen is painful to the touch, the pain extending to the loins and anus, and even shooting down the thighs. When the inflammation has gone to this extent, the skin is hot and dry, the pulse quick and hard, and the tongue dry, with great thirst. If the disease go on increasing, the pulse becomes small and verv frequent, hiccough, vomiting, delirium, fainting, and death ensue.

The inflammation, however, may be of any grade. Sometimes it is mild, yielding readily to proper treatment, and continuing but a short time,

Causes.—It may be brought on by a variety of causes, such as stone in the bladder, wounds, blows, irritating injections, the inflammation of gonorrhœa, extended along the urethra or urinary canal to the bladder, boils, swelling of the prostate gland, the internal use of Spanish flies (cantharides), allowing the urine to remain too long in the bladder, excess in drinking wine or ardent spirits, long-continued exercise on horseback, particularly if the individual has been unaccustomed to it; inflammation of neighboring parts, as the womb or rectum, the introduction of instruments into the bladder, exposure to cold or sudden changes of temperature, and long-continued compression of the bladder by the head of the child during tedious labor. The sex, also, must be considered as a predisposing cause, men being more liable to this disease than women.

Acute inflammation of the bladder continues from ten to twenty or thirty days, and is in general subdued by the necessary treatment without leaving any bad symptoms. But sometimes it terminates in ulceration or mortification, or matter is formed which passes off along with the urine, or is discharged into the cavity of the abdomen. These terminations, however, are rare, compared with its not unfrequent sequence, chronic inflammation. When the urine is examined with the microscope we often find evidences of the inflammation.

Warm fomentations should be constantly applied over the lower part of the belly, and the bowels are to be acted on by a full dose of castor oil, or a clyster of decoction of marsh-mallow or linseed-tea, with an ounce of castor oil. The diet must be carefully regulated in this, as in all other inflammatory diseases. At the commencement, only very small quantities of linseed-tea, or other mucilaginous drink, should be allowed; but when the inflammation is giving way, and the urine begins to be voided more easily, the linseed-tea, or any other demulcent beverage (such as gum-water, prepared by pouring a pint of boiling water on an ounce of gum-arabic), may be given freely, with the addition of from five to ten grains of nitre to each pint.

BLEEDING FROM THE NOSE.

This is by far the most common, and entirely the least dangerous hemorrhage. In general it is slight and frequently advantageous to the individual, and is injurious only when it continues too long or recurs too frequently.

Causes.—Bleeding from the nose occurs most frequently in young people with an excess of blood, and in females with suppressed menstruation. The causes which commonly produce it are those which determine the blood too strongly to the head, such as exposure to heat, too full living, excess in drinking intoxicating liquors or strong coffee; long-continued study, anger, or any violent mental excitement, long watching, constipation of the bowels, and suppression of the discharge from piles. It is also caused by wearing the neckcloth or stays too tight, blows on the nose, &c. It comes on from scurvy, in consequence of the blood losing its natural consistence, and also during typhus fever, and sometimes from disease of the heart and liver.

Treatment.—In the majority of cases, bleeding from the nose is salutary. If it go on to such an extent (which it seldom does) as to cause paleness of the face, sickness at stomach, and a sensation as if the patient were about to faint, it then becomes necessary to use means to arrest its progress.

The individual should be exposed to cool air, and his head should not hang over the basin which receives the blood, but must be kept raised. Pieces of linen dipped in vinegar and water or ice are to be applied over the forehead and temples and round the nose; nor should the popular remedy be forgotten of placing a large key or piece of cold metal between the clothes and the back. If the bleeding still continue, vinegar and water or iced water should be applied frequently over the head, and the feet and hands placed in warm water containing powdered mustard. Bleeding from the nose seldom resists this treatment, but in the event of its doing so we have still other means in reserve.

Powdered gum-arabic blown into the nostrils by means of a quill will sometimes stop the hemorrhage when everything else fails. When clotted blood begins to form in the nostrils it should be disturbed as little as possible.

Cold vinegar and water, or ice applied to the thighs and genitals, has sometimes an excellent effect. A method of arresting bleeding from the nose, which is said to be very effectual, is the following. The patient is to stand up, with the head elevated. The nostril from which the blood flows is to be compressed by the finger, and the corresponding arm to be raised perpendicularly, and to be kept in that position about two minutes; this in almost all cases has proved sufficient.

Pressure on the small artery by the side and angle of the nose for ten minutes will generally stop bleeding at the nose.

BOILS.

A boil begins with a pimple in the skin, which continues to enlarge until it reaches the size of a walnut, though sometimes it does not extend beyond the size of a large pea; it is of a conical shape, red, or of a purple hue, and hard, with burning heat and great pain. Between the fourth and eighth day it becomes very prominent, and begins to *point;* a speck of matter may then be seen on the summit, which gradually softens; the skin at last bursts, and matter mixed with blood is discharged through a small opening. A day or two after this, the core, which is supposed to be a portion of dead cellular substance, finds its way out of itself, or may be squeezed out, leaving an open cavity, which soon fills up, and heals entirely about the twelfth or fourteenth day.

A boil seldom comes alone; there are generally several, either at the same time or following one another. Boils may appear on any part of the body, but they commonly form on the face, nape of the neck, inside of the thighs, hips, arm-pits, groin, or near the anus.

Causes.—Children and people in robust health are most subject to boils; they often come on without any known cause, and appear more frequently in spring than at any other season. They may be brought on by friction, inattention to keeping the skin clean, or from irritation of the digestive organs, and they sometimes follow fever or inflammatory eruptive diseases. They are very common among sailors, and are by them called "salt-water boils."

Treatment.—It is needless to attempt preventing a boil going on to suppuration; it almost invariably follows the course above described, in spite of every means used to arrest its progress. We should, therefore, endeavor to hasten the suppurative process, by the application of warm bread and milk poultices, or poultices of linseed. In many cases a piece of diachylon plaster applied over the part and changed twice a day, will answer better than anything else. If the boil be of a very indolent character, the application of roasted ontons will be of service, or poultices of honey mixed with oatmeal. As soon as it is known that the tumor contains matter, the best plan is to give it vent, by making a free opening with the lancet, and then squeezing out the matter and the core. When the patient is averse to this and allows the boil to burst of itself, the opening is always small, and the core consequently does not readily find its way out. In some cases it requires to be drawn away. In general the cavity heals quickly after the core is discharged, and nothing is required except a little cerate or other simple dressing; the sore in some cases, however, becomes indolent, and requires dressing of a more stimulating nature, such as

Basilicon, a drachm,
Red precipitate, five grains. Mix.
A little of this ointment to be applied on a piece of lint or linen rag.

Where there is hardness of the part after the sore is healed, it should be rubbed with camphorated mercurial ointment night and morning.

With regard to the internal treatment, all that is necessary in general is to abridge the diet a little, avoid stimulating food, and keep the bowels open with *Epsom salts* or other cooling purgatives.

BAD BREATH.

Bad breath may be caused by *decayed teeth*, by a *disordered stomach*, by *exhalations from the lungs*, by *ulceration or other disease of the lungs, bronchial tubes, wind-pipe, throat and nose, or gums*, or by all of these causes combined. The only way to treat bad breath is to remove the *cause* or *causes*. Instead of keeping the mouth filled with antidotes for bad breath, consult some good physician or dentist, or both, and ascertain the cause of your bad breath, and then, if it be possible, let them cure it. Cure the dyspepsia. Extract the decayed teeth. Relieve the catarrh (rhinitis). Give tone and health to the spongy gums.

Bad breath may temporarily arise from eating onions or from drinking spirits, or from tobacco. The cure in such cases is of course very simple—*abstain*.

INFLAMMATION OF THE BOWELS.

This disease, when severe, is preceded by general uneasiness, shivering and heat alternately, listlessness, and a feeling of weakness. A sharp pain in the bowels soon follows, with griping, and a sensation of internal heat at the seat of the pain, which is generally about the navel. The pain is constant, and is increased by the slightest pressure over the belly, which after some time becomes hot, swollen and tense. There is great prostration of strength, urgent thirst, sickness at stomach, perhaps vomiting, and constipation of the bowels, though sometimes there is purging of a thin, bilious, stinking matter. The pulse is quick, hard, and small; the urine high-colored, and passed in small quantities; and the tongue is at first white, and becomes afterwards furred and brown in the middle, with its point and edges red. The patient moves his head and arms frequently, and appears very restless, though afraid to move his body, from a dread of increasing the pain; his limbs are drawn up towards his belly, and he can only lie on the back. All these symptoms, however, are not present in every case, and they are of course more or less severe according to the extent and severity of the inflammation.

When inflammation of the bowels is about to prove fatal, the pulse becomes exceedingly weak, the features shrink, hiccup and cold sweats come on, and the hands and feet become cold; but when it is about to terminate favorably, the pulse recovers its firmness, the stools become natural, the urine is voided freely, and the pain lessens by degrees.

Causes.—The most common causes of this disease are, exposure to cold when the body is much heated, or drinking cold fluids when in the same state; accumulation of hardened excrements in the bowels; eating too freely of high-seasoned food, unripe fruit, or crude vegetable substances; excess in drinking; too strong purgatives; blows on the belly; swallowing acrid or poisonous substances; but it may come on without any obvious cause.

TREATMENT OF INFLAMMATION OF BOWELS.

1. *Opium in large doses, and frequently.*—This is at present the one remedy for this disease. It is proper to give doses of one or two grains every two or three hours. In this disease the system bears a large amount of opium. It constipates the bowels, but that is of little account. In severe cases enormous doses of opium have been given without injury. No other disease bears so much opium as inflammation of the bowels—in men or in women. We may use morphine or laudanum, if we prefer, instead of the crude opium.

2. *Tonics and stimulants.*—These are to be given when the stage

of exhaustion comes on. Quinine may be combined with the opium. Besides, we may give beef-tea, wine, brandy, or whiskey.

When the disease has been subdued, the greatest care must be taken to prevent a relapse. Flannel should be worn next the skin, and the diet should be easy of digestion, and as little stimulating as possible. Wine and spirits should be abstained from for a considerable length of time.

The diseases most likely to be mistaken for inflammation of the bowels, are rupture, colic, and affections of the kidney. Rupture may always be suspected; it is, therefore, necessary to examine carefully both the abdomen and groin. Colic is a spasmodic affection, and commonly requires to be treated with opium, brandy, and other stimulants. The greatest care must, therefore, be taken not to confound it with inflammation of the bowels, in which stimulants would be highly injurious. Colic commences suddenly, and is not attended with fever; the pain is not constant, as in inflammation of the bowels, and it is rather relieved than otherwise by pressing on the belly. In affections of the kidney, though the patient complain of severe pain in the belly, yet it is not increased by pressure, which is invariably the case in inflammation of the intestines. It is needless to say that this disease needs prompt and good medical advice, if it can be obtained.

CONCUSSION OF THE BRAIN.

Concussion of the brain generally arises from injury done to the head by blows, or from a violent shock received by the whole body, in consequence of falling from a height. When the concussion is very severe, the following are the most marked symptoms: insensibility, without the power of moving; pulse weak, slow, and perhaps intermitting; cold extremities; oppressed breathing, but without snoring; pupils of the eyes generally contracted. When to these symptoms are added coldness of the whole body, with short and interrupted breathing, a fatal termination is about to take place. But if the system recover, and reaction come on, then the pulse becomes regular and stronger, the breathing more natural, and the legs and arms get gradually warmer. If the patient be now spoken to in a sufficiently loud tone of voice, he will answer questions, though not very coherently, and if pinched he will show by moving that he is not insensible to pain. These symptoms may give way by degrees, until at length the patient is left without anything to complain of, except perhaps a headache. This favorable termination, however, does not always follow reaction, which in some cases is very strong, and accompanied by inflammation of the brain, which, in spite of every treatment, may in a short time end in death. Concussion is more or less severe, according to the injury which the brain has sustained. When the shock is slight, and the person only stunned, he remains but a very short time insensible, and then gets up as if nothing had happened; when more severe, sickness and vomiting follow, and the patient may have his ideas confused, attended with unwillingness to move about for several hours, or perhaps days.

TREATMENT OF CONCUSSION OF BRAIN.

1. *Rest.*—The patient should be taken to a quiet room, and his clothing should be loosened.
2. *Friction.*—The hand or a cloth may be used to restore the circulation.
3. *Mild Stimulants.*—Hartshorn may be held to the nose. A very little wine may be given if the patient can or will swallow. Warm water may be applied to the feet and cold to the head.
4. *Rest and Time.*—The patient cannot get well at once usually, and cannot be forced into health by violent measures.

Sometimes the patient appears to be getting better when really he is worse. The patient should be very slow about returning to the active duties of life.

INFLAMMATION OF THE BRAIN.

This disease may come on suddenly, but when not caused by external injuries, there are in general certain symptoms which give notice of its approach, namely, headache, attended by a sensation of weight and fulness of the head, slight giddiness, ringing in the ears, occasional drowsiness, confusion of ideas, irritability of temper, and disturbed sleep. The face is more or less flushed, the head feels hotter than natural, and any unusual noise or strong light annoys the patient.

After chills or shivering, which in general precede all inflammatory diseases, strong symptoms of fever come on. The skin becomes hot, the face much flushed, the eyes red, and the pulse full and hard. The patient is then very restless; and light and the slightest noise are insupportable to him. As the disease advances, the thirst becomes urgent, the tongue white, the urine high-colored, and the bowels constipated. In the majority of cases there is irritability of stomach, accompanied by vomiting. At length spasms of the face and limbs, and the most furious delirium come on, and the pupils of the eyes remain contracted. In many cases it is necessary to confine the patient's arms, to keep him from injuring himself or those near him. One or both arms first, and then the legs become stiff and contracted, and occasionally convulsed. When the limbs are in this rigid state, any attempt to straighten them, or even any effort on the part of the patient to move in bed, is attended with severe pain.

In the majority of cases inflammation of the brain reaches its height about the third or fourth day, and generally terminates fatally within a week or ten days. It is one of the most dangerous diseases to which man is liable, and even when it has been overcome, its effects are of the most serious nature.

Causes.—The usual causes of inflammation of the brain are, injuries done to the head by blows or falls; great mental excitement; exposure to excessive heat or cold; excess in drinking spirituous liquors; suppression of the menstrual discharge, or of that from piles. It often comes on in the course of fevers, rheumatism, small-pox, scarlatina, and other diseases of the skin, and may be brought on by certain diseases of the ear.

TREATMENT OF INFLAMMATION OF BRAIN.

1. *Active Purging.*—The bowels may at first be opened with one drop or half a drop of croton oil on the tongue, or by a dose of elaterium, or better still for the majority of cases, *Epsom salts.*

The bowels should be kept free by medicine during the whole progress of the disease.

2. *Cold to the Head.*—Pounded ice may be placed in a bag and kept on the head. The head may be shaved, so that the ice and water may be more directly applied. Wet cloths are not as good as pounded ice, and when they are used they must be kept constantly wet, else they may do no good, but rather injury.

3. *Warmth to the Feet.*—Mustard plasters can be applied to the calves of the legs. The feet may be soaked in warm water, and thoroughly rubbed. Sometimes children are benefited by a warm bath.

4. *Blisters to the Scalp.*—These should not be used until the inflammatory stage is over. They should be applied over the entire scalp.

5. *Stimulants and Nutritious Food.*—In the later stages the debility is so marked oftentimes, that whiskey, or brandy, or wine,

or opium may be needed in addition to nutritious food. In the inflammatory stages the diet should be light.

The recovery needs great care. It is a matter usually of considerable time. Patients should be exhorted to take it easy, and not be in too great haste to return to activity. *In all real or suspected inflammations of the brain, medical advice should, if possible, be obtained without delay.*

BRIGHT'S DISEASE. (See *Kidneys, Diseases of.*)

BROMIDE OF AMMONIUM.

This remedy has been given of late in *whooping-cough.* It is very often combined with bromide of potassium. It is the opinion of Dr. Brown-Séquard that when it is given in combination with bromide of potassium, less heroic doses of the latter remedy are necessary.

BROMIDE OF POTASSIUM.

Bromide of potassium is one of our most recent and most successful remedies. Fifteen years ago it was hardly known of. It is now used to a most enormous extent, and fully deserves most of its reputation. It is a remedy of wonderful efficacy. It tends to reduce the volume of blood in the brain, and also exercises a peculiar anæsthetic or calming effect on the nervous system.

It is very successful in *sleeplessness.* In the majority of cases of sleeplessness, though not in all, it proves very beneficial, and rarely leaves any unpleasant effects. It is therefore superior to opium, henbane, &c.

It is the best remedy that we know of for *epilepsy.* It is very useful in *neuralgia*, in *insanity*, in *delirium tremens*, in *hysteria*, in *asthma*, in *sick headache*, and in over-excitement of the genital organs.

Indeed, it is used with advantage in nearly every form of nervous trouble. It is sometimes applied locally to the throat.

It may be given in doses of *five or fifty grains.* It may be used very freely. When small doses do not answer our purpose, it is well to increase them until we see some effect. In ordinary cases it can be given in doses of twenty or thirty grains three times a day, without injury. Sometimes it produces eruptions on the body. In rare cases it has, when given in very large doses, produced the symptoms of insanity. Such cases are, however, exceptional.

Epileptics sometimes take this remedy in large doses for months and years, without experiencing any evil effects. When it is taken for a long time it is well to combine it with bromide of ammonium, or with some bitter tonic, such as gentian.

Bromide of potassium has a saltish taste. If it is given largely diluted with water—say one-half a tumblerful—the taste is much disguised, and it is less irritating to the stomach.

Bromide of potassium, like carbolic acid, glycerine, pyrophosphate of iron, and cod-liver oil, has grown into popularity with very great rapidity.

BRONCHITIS.

By this term is meant inflammation of the bronchi, or tubes which convey the air into the lungs.

When the wind-pipe arrives as low down as the third or fourth vertebra of the back, it divides into two great branches, called bronchi, one of which goes to the right and the other to the left lung. These branches having entered the lungs, divide, subdivide, and ramify into innumerable small branches, all of which terminate in very minute bags, called air-cells. These air-tubes and cells are lined with a membrane, termed, from the nature of its secretion, mucous membrane, which is the seat of bronchitis.

Bronchitis shows itself in two forms, the *acute* and *chronic*.

ACUTE BRONCHITIS.

After exposure to cold, which is the usual cause of this affection, the mucous membrane, which lines the nostrils, wind-pipe, and bronchi, becomes slightly inflamed. The consequences of this are dryness and stuffing of the nose, hoarseness, dry cough, and a slight degree of fever, soon followed by expectoration of a thin fluid, a feeling of tightness about the chest, and increase of cough. After some time the expectoration becomes very copious, and of a much thicker consistence; all the feverish symptoms give way, and in the course of a few days the cough gradually moderates, and the patient recovers. This is a mild form of bronchitis. It is frequently accompanied by cold in the head, is not of a serious nature, and requires very little medical treatment.

Bronchitis, however, does not always appear in this mild form. It presents a variety of grades, from the slightest *common cold* to the most acute inflammation, causing symptoms of a character so urgent as to require the most active treatment to prevent a fatal termination.

When severe it commonly commences with hoarseness, slight sore throat, perhaps cold in the head, and the feverish symptoms which usually precede all acute inflammatory diseases, viz., chilliness or shivering, alternating with flushes of heat, lassitude, unwillingness to move about, and pain (or at least a sensation of soreness) in the back and loins. The pulse is quick and weak, and the urine diminished in quantity. These symptoms are soon followed by headache, hot and dry skin, thirst, foul tongue, quick and full pulse, and scanty urine of a high color. To these general symptoms of fever are added those more peculiar to bronchitis, namely, oppression on the chest, attended with dull pain and heat, a distressing dry cough, and considerable difficulty in breathing. At first there is no expectoration, because the mucous membrane is dry; but as the disease advances, each fit of coughing brings up a thin acrid fluid of a salt taste. As the expectoration increases in quantity, it becomes less acrid and loses its salt taste. It then acquires a thicker consistence, and assumes the appearance of white of egg; is very viscid, and sticks to the sides of the vessel. The more viscid and tenacious it is, the more severe is the inflammation. The feverish and other symptoms become more severe towards evening, and during the night the patient is very restless, and the fits of coughing continue longer and recur more frequently than during the day. About the sixth or seventh day the expectoration begins to grow thicker and more opaque, and the difficulty of breathing and tightness at the chest gradually diminish. At length the expectoration acquires a yellow or greenish color, and is brought up easily, the sensation of heat within the chest is no longer felt, and the cough is not so frequent or troublesome, except on awakening in the morning, when it continues until the mucus which accumulates in the air-passages during the night is freely discharged.

Bronchitis seldom terminates fatally, unless complicated with other diseases; but when it attacks a great part of the mucous membrane of the air-passages of one or both lungs, and extends to the smallest air-tubes, it is not unattended with danger, and in old people and children frequently proves fatal. In such cases the breathing becomes much oppressed, a wheezing or rattling noise is heard in the chest, and there is great prostration of strength. (See *Auscultation.*) *Only the experienced physician can determine the meaning of these sounds.* The mucus accumulates in the air-passages, and the patient has no longer strength to cough it up. The face and lips then change from deadly pale to a livid color, the pulse is small and quick, cold clammy sweats break out on the body, the extremities become cold, and the patient sinks. *At the present time the physician, in studying this and all other diseases of* *the chest—acute and chronic—relies upon his ear more than upon the appearance of the patient.*

CHRONIC BRONCHITIS

Is almost invariably the result of the acute form, and is generally met with among old people and those of weak habit of body. It differs from the acute form merely in the mildness of its symptoms and in its longer duration. There is cough, and profuse expectoration of an opaque, white, yellow, or greenish matter, of a loose consistence, not resembling the viscid discharge of the first stage of the acute form. In many cases there is a slight degree of feverish excitement during the day, which increases a little towards night; but fever is not a characteristic symptom of the chronic form, unless in the worst cases, when it comes on in the evening, followed by night-sweats and other hectic symptoms. The cough is most troublesome during the day, and on awaking in the morning it continues for an hour or two, followed by very copious expectoration. One may labor under chronic bronchitis for years without the general health being much impaired, but in most cases, when it continues long, habitual shortness of breathing, wheezing and oppression in the chest ensue; and these symptoms are aggravated on going up stairs, or in using any particular personal exertion. With many persons chronic bronchitis is of so mild a character that they scarcely consider it a disease. In other cases, the patients are completely worn out by the cough and excessive expectoration.

Causes.—A most fruitful cause of bronchitis is exposure to cold after the body has been heated by exercise or sitting in a warm room. The theory is advocated by some, that cold is caught just as readily by changing suddenly from cold to warm air. When the body has been chilled by long exposure to cold, warmth should be restored by degrees. When a person has been in the cold air, he should remain for some time in a room moderately heated, and avoid at first sitting near the fire. By avoiding sudden changes of temperature any one, however susceptible of catching cold, may take exercise with impunity in the coldest air, provided the surface of the body and feet are kept warm by suitable clothing.

TREATMENT OF ACUTE BRONCHITIS.

1. *To open the pores of the skin and cut short the disease.*—This is best done by my cold powder (see *Cold Powder*). A dose (3 to 5 grains) should be given as early as possible after "taking cold."

Every hour of delay makes it harder to break up the attack.

The powder is best given at night, in a little water. It may be taken for several nights in succession.

The ordinary *Dover's powder* should be given when the more agreeable Cold powder cannot be obtained. It should be given in doses of 5 to 10 grains in water, but it is at best an unpleasant compound.

Besides these powders it is well to take a brisk purgative of some kind, and it is of little consequence just what substances are used. It is an advantage also to take a hot foot-bath.

2. *To cure the bronchitis after the above attempt to shorten it has failed.*

The principal remedies used during the fever are these:

1. *Tartar emetic.*—⅛ or ¼ of a grain every three or four hours.
2. *Blister over the breast-bone, or friction with croton oil.*

Milder cases may be treated differently:

1. *Warm and soothing drinks.*
2. *The following prescription for an expectorant:*

Syrup of ipecac,
Syrup of squills, equal parts.
Half a teaspoonful every two or three hours.

When the cough is very agonizing, a *little* laudanum, or paregoric, or morphine may be added to this mixture.

Expectorants are *uncertain* medicines.

3. *Inhalations of tar-water, or simply steam of water.*

4. *Stimulants, tonics, and nourishing food.*—When the stage of debility comes it is necessary to sustain the system by abundance of good food—eggs, fresh meat, beef-tea, &c., by whiskey, and the bitter tonics and wine.

Chronic bronchitis may be mistaken for consumption, and consumption may be mistaken for chronic bronchitis.—In a doubtful case there is only one way to settle the question. Consult some educated physician who is accustomed to sound the chest. It is only by actual examination of the chest that we can tell accurately whether a patient has consumption or chronic bronchitis. The general symptoms of cough, poor appetite, paleness, weakness, and night-sweats, &c., do not settle the question; but in the present state of science it is possible for a physician practised in auscultation to determine certainly whether a patient has consumption or simply chronic bronchitis. *The question is a very serious one.* Charlatans grow rich by prescribing for patients with chronic bronchitis who imagine they have consumption. Thousands of patients are cured of chronic bronchitis by quack medicines—or rather get well while they are taking them, or in spite of them—who suppose that they are cured of consumption. Thousands of certificates of cures of consumption are continually published by patients who never had consumption at all.

On the other hand, thousands of patients are annually dying of consumption, who, until perhaps the very latest stages, never suspected or admitted that they were suffering from anything more than chronic bronchitis.

The true course for the patient who is harassed by a lingering cough, night-sweats, is to consult some skilful physician and abide by his decision.

TREATMENT OF CHRONIC BRONCHITIS.

1. *Tonics and stimulants.*—The elixir of quinine, strychnine and iron (Wyeth's or Caswell & Hazard's), or any of the ordinary tonic mixtures, will serve the purpose. Arsenic (Fowler's solution) is good. *General electrization* is useful where it can be employed. Cod-liver oil is valuable here, as it is also in consumption. Pure air, sunlight, and sleep are indispensable.

2. *Counter-irritation over the chest.*—This is done by croton oil, or pitch plaster, or mustard plaster.

3. *Inhalations* of carbolic acid, creosote, tar-water, muriate of ammonia, chlorate of potash. (For doses, &c., see *Inhalations.*)

4. *Expectorant medicines.*—These are uncertain. Any one of the hundreds of prescriptions may be tried. No one *is a specific.* There is a vast amount of *humbuggery* in the use of expectorants.

5. *Change of air.*—Going to a warm climate for a few months is often useful, but frequently disappoints us.

The patient must wear warm clothing, remain at home as much as possible, avoid changes of temperature, live sparingly, and abstain from all stimulating liquors. To relieve the cough and assist expectoration, the following mixtures may be found useful—

Squill vinegar, an ounce and a half,
Tincture of henbane, two drachms,
Mucilage of gum arabic, two ounces and a half,
Syrup of orange peel, honey, or common syrup, an ounce and a half,
Peppermint-water, six ounces. Mix. A tablespoonful to be taken four or five times in the course of the day, or at any time when the cough is troublesome. Or,

Almond emulsion, eight ounces,
Acetate of morphia, half a grain. Mix. A tablespoonful of this mixture is to be taken four or five times a day, and two tablespoonfuls at bed-time. Or,

Almond oil, half an ounce,
Solution of the carbonate of potash, half a drachm,
Syrup of tolu, an ounce,
Syrup of poppies, an ounce,
Water, five or six ounces. Mix. A dose of two tablespoonfuls to be taken several times in the course of the day, or when the cough is troublesome.

The debility which attends this affection renders both general and local blood-letting improper. Without the greatest caution it cannot be resorted to even when acute bronchitis supervenes upon the chronic form, a complication which always constitutes a very serious case. The acute form, in such case, is announced by considerable diminution or a total cessation of expectoration, great difficulty in breathing, and the usual train of febrile and inflammatory symptoms; it is very difficult to manage, and frequently in old people and debilitated subjects goes on rapidly to a fatal termination, in spite of every effort to arrest its progress.

The constant use of cough mixtures, composed principally of expectorant remedies, such as squill, ammoniac, &c., can only tend to debilitate and weaken the patients. Small and frequently repeated doses of anodyne remedies should be administered to mitigate the cough, and thereby diminish the irritation; and though this treatment can only be considered as palliative, it gives considerable relief. We ought to remember that every anodyne medicine loses its effect after a time; consequently it becomes necessary either to increase the dose, or have recourse to another remedy of the same class.

Concerning the use of remedies in bronchitis, Professor Flint thus remarks: "Medicines may be employed with a view to palliation and cure. If cough be troublesome, exceeding the amount requisite for expectoration, soothing remedies are called for. Opium, however, is to be prescribed with circumspection, in the first place, lest the habit of using it be formed. This is a consideration to be taken into account in all chronic affections. And, in the second place, in feeble subjects, and under circumstances in which there may be danger from an accumulation in the tubes, serious consequences may sometimes follow the blunting of that sense of the presence of morbid products which leads to their removal by efforts of expectoration. Moreover, the use of opium tends to impair the digestive powers. For this reason, other anodynes, such as hyoscyamus, conium, belladonna, and hydrocyanic acid are generally to be preferred.

"As a rule, the remedies which are given as expectorants are not indicated. The nauseant expectorants do harm by their depressing effect, and by disturbing the appetite and digestion. The stimulant expectorants, such as squill, senega, etc., are of doubtful efficacy, and, if not useful, are more or less hurtful. Certain remedies, however, sometimes exert a curative effect. This is true of the balsam of copaiva. I have known this remedy to act almost as a specific; yet, in many cases, it has little or no effect."

ANODYNE COUGH MIXTURES.

Acetate of morphia, a grain, dissolved in a little almond oil,
Almond emulsion, three ounces,
Camphor mixture, the same quantity,
Mucilage of gum arabic, half an ounce. Mix. A table-spoonful to be given as a dose three or four times in the course of the day.

Extract of hemlock and extract of henbane, of each five grains,
Mucilage of gum arabic, two drachms,
Spirit of mindererus (solution of the acetate of ammonia,) half an ounce,
Peppermint-water, or common water, six ounces,
Syrup of red poppy, a drachm. The two first ingredients to be well mixed with the mucilage before the others are added. A table-spoonful a dose, three or four times a day, or at any time when the cough is troublesome.

To prevent the recurrence of bronchitis, the patient should guard against changes of temperature as much as possible, take regular exercise in the open air, attend to the state of his bowels, and wear flannel next the skin. Sponging the chest every morning with sea-water, or cold water containing a portion of salt, and in summer bathing in the sea, and the shower bath, are also excellent preventives of bronchitis.

BRONCHOCELE.

Bronchocele is a swelling on the fore-part of the neck, caused by a preternatural enlargement of the thyroid gland, one of the cartilages of the larynx. In England it is generally called *Derbyshire neck*, and in France and Switzerland is known by the name of *goitre*. The swelling, in its simple state, presents a smooth surface; the skin which covers the tumor is not discolored, and is neither painful nor tender when touched. In the more complicated cases the neighboring parts become affected, and the swelling sometimes increases to a great extent, causing a shocking deformity. In some individuals it hangs down over the upper part of the breast, and in others it rises as high as the ears. When the tumor is large it presses on the windpipe, and causes hoarseness of voice, and impedes the breathing; the jugular veins being also compressed, the free circulation of the blood in the head cannot be carried on, and the consequences are head-ache, drowsiness, giddiness, and sometimes apoplexy.

Bronchocele is very seldom attended with danger; it may continue for years, and even throughout life, without causing pain or much inconvenience. There are no doubt cases occasionally in which inflammation comes on; the tumor then becomes hot and painful, the skin covering it assumes a red and shining appearance, and the veins running under the skin are much enlarged. In scrofulous persons matter has even been known to form and find vent externally. Scrofula, however, does not appear to be particularly connected with this disease.

Causes. The various opinions started respecting the cause of Bronchocele, when closely examined, appear so doubtful and contradictory, that we are left, after all the inquiries and observations made with regard to it, as ignorant of its origin as we are of the use of the thyroid gland, where the complaint is seated.

Treatment. Iodine, if judiciously used, particularly when the individual is removed from the locality where this disease prevails, may be said to cure it in the majority of cases. This should be given in small doses frequently repeated. It is then perfectly safe; but if given in too large doses, or carried too far, it brings on lowness of spirits, loss of appetite, dimness of sight, nervous irritability, and palpitation of the heart, or it may irritate the stomach and produce purging. If the patient complain of heat of the stomach and griping, the iodine should be discontinued for a day or two, or the dose may be diminished; these effects, however, are very seldom produced when the following preparation is given as here directed—

Hydriodate of potash, thirty-six grains,
Iodine, ten grains,
Distilled water, ten ounces. Mix. Dose of five drops three times; gradually increase to twenty or thirty drops.

As an external application, use the following ointment—

Hydriodate (or iodide) of potash, half a drachm,
Lard, an ounce to an ounce and a half. Mix. A drachm of this is to be well rubbed in over the surface of the tumor night and morning.

Or a liniment composed of

Tincture of iodine, a drachm,
Compound soap liniment, an ounce. Mix.

In some cases the skin covering the tumor is irritated by the iodine ointment, and a considerable degree of inflammation takes place. When this occurs, the ointment should be discontinued, and the inflammation reduced by the application of six or seven leeches to the part, to be followed by poultices of warm bread or linseed.

In some cases Bronchocele yields to iodine in the course of a month or two, in others it is necessary to keep the system under its influence during ten or twelve months before a cure can be effected.

A seton placed in the skin over the Bronchocele has sometimes the effect of curing it when iodine fails; but if the tumor be very hard or partly ossified, neither of these remedies produces any good effect. The diet ought to be of a sufficiently substantial and nutritive quality, since this disease generally occurs in delicate females of relaxed constitutions. Bronchocele has disappeared entirely in many cases, particularly in young people, from change of residence alone. In others it has been cured by simply rubbing the tumor two or three times a day (a quarter of an hour or twenty minutes each time) with a dry towel; or with a little camphor liniment. The swelling must be always carefully covered, so as to prevent its being acted on by sudden changes of temperature.

BUCHU LEAVES.

These are useful in gleet, and certainly have an excellent effect in strengthening the digestive organs.

The leaves of the buchu are given in the forms of infusion and tincture.

Infusion.—Take of buchu leaves an ounce, boiling water a pint; macerate for four hours in a lightly-covered vessel, and then strain through a piece of linen. Two or three tablespoonfuls to be taken as a dose three or four times a day.

Tincture.—Take of buchu leaves two ounces, proof spirit a pint; macerate for seven days. Three or four teaspoonfuls a dose, in a little water, three or four times daily.

BUNYONS.

A bunyon is a swelling on the inside of the first joint (or ball, as it is commonly called) of the great toe, caused by the pressure of tight boots or shoes. The same term, however, is sometimes applied to a similar swelling on the first joint of the little toe, or on the instep. Those who are troubled with bunyons have generally the great toes turned outwards, and the little toes inwards, to an unnatural extent. This almost invariably arises from wearing boots or shoes too narrow at the extremities, thereby causing the toes to be squeezed in an improper position against each other.

Treatment.—Since a bunyon is caused by undue pressure, the pressure, of course, should be removed. The necessity, therefore, of wearing loose boots or shoes is obvious. They should be without high heels, which would cause improper pressure on the fore part of the foot, and made of cloth or of buck-skin, or some other soft leather, and so constructed as to allow ample room at the parts corresponding to the bunyons.

When a bunyon is not inflamed, the pressure may be, in a great measure, removed by applying over it and the surrounding parts a piece of thin linen or silk, spread with diachylon plaster, and over the latter a piece of thick buck-skin leather of the same dimensions, likewise covered with diachylon, perforated with a hole of the size of the bunyon. The pressure is thus removed, and thrown on the adjacent parts. This method of treatment may be assisted by having the sole of the shoe considerably thicker towards the inside of the foot.

Wearing a new shoe, or one tighter than usual, much walking, particularly in warm weather, or other causes, may bring on inflammation in the bunyon, which then becomes so painful that the slightest pressure cannot be tolerated. In this case, use warm linseed poultices and warm fomentations, and apply leeches to the surrounding parts. But it sometimes happens that, notwithstanding these remedies, matter forms, and the lancet is required to give vent to it. The application of iodine ointment, prepared as follows, has often an excellent effect in relieving an inflamed bunyon.

Iodine, twelve grains,
Lard, or spermaceti ointment, half an ounce. Mix.

A small portion of this ointment (about the bulk of a horse-bean) is to be rubbed gently on the bunyon twice or thrice a day.

CALAMINE, OR CARBONATE OF ZINC.

Prepared calamine is sometimes sprinkled over ulcers, with the intention of diminishing the discharge of matter when in excess; or for the purpose of absorbing acrid matter, and thus preventing it from spreading, and irritating the surrounding parts. It is used in the same manner when the skin is chafed, particularly in children, who are very liable to excoriations at the arm-pits, groin, and behind the ears. It generally checks the discharge of matter in these cases, and prevents the necessity of employing astringent lotions. To prevent excoriations in children, the powder is also frequently dusted over the parts where they are most likely to take place.

Calamine enters into the composition of the cerate commonly known by the name of *Turner's Cerate*, which is prepared by mixing calamine and yellow wax, of each half a pound, with a pint of olive oil. The oil is first mixed with the melted wax, and, when removed from the fire, the calamine is gradually added, and the mixture constantly stirred until it becomes cold. This cerate is used to promote the healing of ulcers and excoriations, and was formerly much in repute as an application to the ulcerated surface arising from burns.

CALUMBA

Calumba, or columbo, has been long in high esteem as a mild tonic and stomachic, having no astringent quality, and being but very slightly stimulant. When there is loss of appetite, flatulency, acidity, nausea, and the train of symptoms arising from a debilitated state of the stomach, calumba is of great use, and sits lightly on the most delicate stomach, without producing any excitement of the system; on this account, it is the tonic commonly used to strengthen the stomachs of consumptive patients. We may give it with advantage to relieve the acidity and sickness of stomach so common at the commencement of pregnancy; and also to children, for the purpose of allaying the vomiting and purging to which they are so subject when teething. Those who have lived long in tropical climates have generally weak stomachs, easily deranged by errors in diet, and are subject to occasional derangement of the biliary organs; in such cases, calumba will often be found more beneficial than any thing else, by giving tone to the weakened stomach, and correcting the depraved or redundant secretion of bile. It is of the greatest service in the bilious disorders of warm climates.

The dose of calumba root in powders is from fifteen to sixty grains. The tincture is given in doses of two or three tea-spoonsful. The dose of the infusion, which is made in the following manner, is two or three table-spoonsful, repeated three or four times a day.

Take of calumba root, sliced, five drachms,
Boiling water, a pint. Macerate for two hours, and then strain through a linen rag.

This infusion spoils if kept long.

CAMPHOR.

Camphor is a powerful stimulant. It should be given in doses of from four to fifteen grains in malignant typhus, in the worst forms of measles, small-pox, scarlet-fever, and other eruptive diseases, when accompanied with typhoid symptoms; and also to bring back the eruptions when they have disappeared too suddenly. It has often an excellent effect in painful menstruation, when given in doses of three grains three or four times a day. As an antispasmodic, it is given in asthma, hysterics, St. Vitus's dance, epilepsy, hiccup, and other spasmodic diseases. To promote perspiration at the commencement of a cold, an ounce of the camphor mixture, with ten grains of nitre in barley-water, or any other warm drink, every three or four hours, is a common and very serviceable remedy. Camphor is useful as a sudorific in many cases; but should never be given when any inflammatory action is present. Camphor mixture is given to prevent, as well as to soothe the irritation of the urinary organs, which sometimes arises from the application of a blister; and with the same intention when squills, balsam of copaiva, turpentine, and other medicines which act on these organs, are administered.

Camphor mixture is prepared in the following manner.

Take of camphor, half a drachm,
Rectified spirits, ten minims (drops,)
Water, a pint. First rub the camphor with the spirit, then with the water, gradually poured in, and strain through linen.
Of this mixture four table-spoonsful may be given every three or four hours.

The following camphor julep, in common use, is made by rubbing together

A scruple of camphor,
Two drachms of sweet almonds, blanched,
A drachm of sugar,
And six ounces of peppermint-water,
Two table-spoonsful to be taken as a dose every two or three hours.

Camphor is much in use as a counter-irritant; for this purpose it is usually mixed with oil. An ounce of camphor dissolved in four ounces of olive oil forms the camphor liniment of the London Pharmacopœia; either this or the compound camphor liniment, which contains ammonia, is rubbed over the joints, or other parts affected with chronic rheumatism. It is used in the same manner for nervous pains, bruises, sprains, indolent swellings, &c. A piece of flannel soaked in a strong solution of camphor, (two ounces of camphor mixed with four ounces of rectified spirits of wine,) applied over the chest, and covered with oiled skin, has sometimes the effect of relieving attacks of spasmodic asthma, angina pectoris, cramp, and other cases, where there is local derangement of the nervous power.

CANCER.

Although the most enlightened and skilful men regret their utter ignorance of any means of eradicating this formidable malady, empirics are everywhere to be found, who boast of being able to cure this disease by secret remedies, which they pretend to have discovered; and thus live by deceiving the ignorant and unfortunate individuals who, with that clinging to life so natural to every one, resort to them in the vain hope of being cured.

Cancer is a disease common to both sexes, but women are more subject to it than men. It is not often seen in people under twenty-five years of age, and very rarely before the age of puberty. Women are most frequently attacked after the menstrual discharge has entirely ceased; but it often occurs in men at an earlier period of life. It may attack any organ of the body; but in women the breast and womb, and in men the lower lip, stomach, liver, and testicles, are the parts most frequently affected.

The exciting causes of cancer are *general* and *local*. The most frequent *general* causes are low diet, long-continued trouble of mind, the depressing passions generally, and the suppression of any habitual discharge, such as the menstrual secretion, or the discharge from piles. The most common *local* causes are blows, or other local injuries, undue pressure, and repeated and long-continued irritation; but in many cases no cause whatever can be traced. The general opinion, however, is, that none of these causes could have any effect in bringing on cancer unless the system were previously disposed to the complaint; but of the nature of this predisposition we know little: it is probably often hereditary.

The pain of non-malignant tumors is generally aggravated by pressure, while that of cancer is most severe when the patient is perfectly quiet and undisturbed.

CANCER OF THE FEMALE BREAST

Is by far the most common of all cancerous affections; and the period at which it is usually observed is between forty and fifty years of age.

It is often a very difficult matter to distinguish between other tumors of the breast and those resulting from the first stage of cancer. The symptoms, however, the most characteristic of a cancerous tumor are, its constant progress, great hardness, irregular shape, and unequal, lobulated, or knobbed surface; the darting or lancinating pains (though similar pains are sometimes felt in other tumors); and, at a more advanced period, the dusky, leaden color and puckered appearance of the skin, and its attachment to the tumor. When a tumor of the breast is felt fluctuating, and the skin is changed in color and feels hotter than natural, it is certainly not of a cancerous nature. Cancer of the breast is influenced by the menstrual discharge during three or four days prior to its occurrence, the pain in the tumor increases, and it is much relieved for several days after that discharge has ceased. An indurated tumor of the breast may exist for years without giving any pain or uneasiness, until the entire cessation of the menses, at which period it becomes increased in size, very painful, acquires all the characters of cancer, and goes on rapidly to a fatal termination. But when the tumor does not appear until some years after that period, and more particularly if not till after sixty years of age, it sometimes progresses slowly, and is accompanied by little pain.

Treatment.—Many tumors of the breast are not of a cancerous nature, are harmless, and may be cured by very simple means. Yet they ought all to be looked upon with the greatest suspicion, particularly if they have originated without any known cause, or have existed for any length of time. No female, on detecting any unnatural hardness in her breast, should rest satisfied until the necessary means have been adopted to get rid of it. There can be no greater folly than to trifle with a tumor of the breast, whether it may have arisen from a blow, or from a milk abscess, or any other cause.

In this, as in all other cases of incurable disease, it is best to consult some good physician, and have our doubts settled for better or for worse. Anything is preferable to suspense.

Treatment of Cancer of the Breast—When the tumor is removed by an operation it usually returns. The propriety of an operation in each case must be determined by some reliable surgeon.

All that we can do usually is :—

1. To sustain the general system by nourishing food, tonics and stimulants, and sunlight.
2. To relieve the pain by opium and other anodynes.

The treatment then consists in mitigating the pain, and tranquillizing the nervous system, by means of hemlock and other narcotics ; in dressing the sore with emollient and soothing applications; in supporting the patient's strength by light nutritious diet, easy of digestion, and by the administration of tonics, the most suitable of which are *quinine*, and *elixir calisaya*, and *strychnine*.

CANCER OF THE STOMACH.

Women are most liable to cancer of the breast ; men to cancer of the stomach, which is equally to be dreaded, since the latter form is also invariably fatal in its termination. It is usually brought on from blows over the stomach and other external injuries ; long-continued excess in eating and drinking; distress of mind, and hereditary disposition. It is seldom met with before the age of thirty, and is in general a disease of advanced life.

This form of cancer commences with uneasiness at stomach without pain, heartburn, eructations, and other symptoms of indigestion ; and it cannot at first, and even for several months, in many cases, be distinguished from that complaint. After a longer or shorter period, however, the symptoms of cancer become so decided, that there can be no longer any doubt with regard to the nature of the case. Shooting pains are felt at times extending to the back and loins; the mind becomes much dejected and the body emaciated; sickness and vomiting are experienced from the slightest error in diet. The parts of the stomach most frequently affected with cancer are the *pyloric*, or lower opening leading to the gut; and the *cardiac*, or upper opening, where the gullet terminates. When the lower orifice, which is more frequently the seat of this disease than the body of the stomach, or its upper orifice, is affected, the pain is much increased about three or four hours after taking food; sickness then comes on, followed by vomiting, which relieves the patient for a time; but, if the disease be at the upper orifice, the pain is severely felt as soon as the food has passed down the gullet; from the irritation produced, the food is frequently returned almost immediately; when, however, it has entered the stomach the pain ceases. Some patients, rather than be subjected to this kind of torture, almost starve themselves. When these apertures are in a state of health, and the cancer is situated in the body of the stomach, the food enters without inconvenience, but gives great pain shortly afterwards, and vomiting frequently follows. At this stage of the disease the pain is increased on pressure over the stomach, and in many cases a hard swelling may be felt. To these symptoms are added, obstinate costiveness, thirst, feverish restlessness during the night; and, in some cases, the stomach retains the food which has been just swallowed, and rejects that which had been taken the day before; in others it accumulates during several days, until at last the stomach becomes so distended, that free vomiting of the half-digested aliment, mixed with watery or ropy mucus, takes place.

At first there is considerable difficulty in detecting this disease, inasmuch as the pain may not be of a lancinating or stinging kind, and the vomiting not regular; and though there may be acid eructations, fetid breath, flatulence, distention and a feeling of weight at the stomach, and occasional vomiting, yet all these symptoms might arise from other causes. But when the more marked signs already enumerated are present, particularly when there is vomiting of a fetid dark-colored matter, resembling coffee-grounds or chocolate; and when a hard tumor can be felt between the false ribs of the right side and the navel, which changes its position to a certain extent, according as the stomach is full or empty, there can then be no doubt with regard to the nature of the disease.

Cancer of the stomach is very irregular in its progress: sometimes the symptoms are much relieved for a time, and the patient thinks he is getting better; in some cases it advances rapidly, and terminates fatally within a few months; in others, it continues during many years.

This disease does not usually occur before forty years of age.

The patient is usually starved to death in the course of one or two years.

Treatment of Cancer of the Stomach.—There is no treatment for this disease. All that can be done is to smooth the patient's passage to the tomb. He should be nourished by beef-tea, milk, wine whey, and stimulants. It may be necessary in some cases to inject the fluid food into the rectum.

The pain should be relieved by the use of opium, henbane, and chloroform.

In these incurable diseases we are justified in using anodynes in just as large doses as may be found necessary to relieve pain and procure sleep. All that we can do in cancer of the stomach is, then:—

1. To sustain the strength by appropriate nourishment.
2. To relieve pain by anodynes.

Since cancer of the stomach cannot be distinguished at first from disorders of that organ, of a slow, inflammatory nature, it follows that the treatment, as long as there is any doubt existing, should be directed towards a radical cure, and not to merely palliating the symptoms. A rigorous and properly regulated diet is at this early period the chief means to be relied on. The patient must confine himself to food of a mild nature, and everything which would excite the stomach or increase the irritation should be strictly avoided. Milk in most cases answers better than anything else: some stomachs, however, cannot support it. When milk turns acid on the stomach, it is of course unsuitable. In some cases a little animal food, properly masticated, is most easily digested; in others, liquid diet, such as mutton broth, veal broth, and beef-tea, is more suitable. But, in general, arrow-root, tapioca, sago, blanc-mange of rice, the preparation of oats, well known in Scotland under the name of *sowens*, and other mild farinaceous substances, taken in small quantities at a time. will be found to produce the least irritation. Animal jellies in small quantities may be tried; and there can be no better article of diet than asses' milk, when it agrees with the stomach. The object is to give the stomach as little work to perform as possible, and to avoid irritation by improper food; nor should it ever be overcharged with any kind of food, since we know that when in a disordered state it cannot carry on the process of digestion as in health; and half-digested aliment must of course act as a source of irritation. The drinks to which the patient should give the preference are, lemonade, orgeat, barley-water, a decoction of liquorice, and linseed tea.

CANCER OF THE WOMB.

When cancer attacks the hollow organs or cavities, it begins almost invariably at their openings, as the lips, the upper and lower openings of the stomach, the fundament, and the mouth of the womb. The body of the latter organ is very seldom primarily affected; its mouth and neck first become gradually indurated and enlarged, and the symptoms at this stage are so obscure that the individual may be a considerable length of time without knowing that any diseased action is going on. But when the second or ulcerated stage has begun, the symptoms are sufficiently apparent. No cause can be assigned for this disease; it attacks the married and unmarried, and may commence at any age after puberty; but the period at which it usually begins is a little before or after the turn of life.

In general the first symptom that alarms the patient is a more or less profuse flooding, recurring at irregular intervals, which is preceded or followed by the discharge called the whites. This discharge after some time acquires a fetid smell and becomes thin, and brown or greenish in its appearance. A disagreeable sensation of weight soon begins to be experienced at the lower part of the belly, accompanied with occasional pains of a bearing down or aching kind. The patient at this time may retain her usual strength and appearance, but by degrees her limbs waste and lose their natural plumpness, though the face may appear very little changed, and she complains of an aching sensation and weakness about her loins. As the disease goes on the emaciation and debility increase, the face appears shrunk and deadly pale, or of a pale straw color; dull, dragging, burning, and lancinating pains are felt at the lower parts of the belly and back, extending to the groins and thighs, the urine requires to be frequently discharged, and there is considerable pain attending the evacuation of the bowels. At a still later period of the disease all the symptoms are aggravated; the pain, without the aid of strong anodyne remedies, would be intolerable; the peculiar smell from the matter discharged is almost insupportable, the stomach becomes very irritable, frequent vomiting harasses the patient; and the debility is often greatly increased by frequent discharges of blood from the genitals. The patient being no longer able to withstand the pain, hectic fever, and want of sleep, sinks from exhaustion, or she may perish from a profuse discharge of blood. Sometimes the cancer eats its way both into the bladder and bowels; the urine and excrements are then mixed with the cancerous matter, and are discharged involuntarily. This deplorable state, however, cannot exist long; inflammation soon follows, and puts an end to the patient's suffering. The length of time required by this disease to run its course is very variable; in general, the younger the patient is, the quicker it carries on its ravages; but it may remain in the occult or scirrhous state during several years.

We have already mentioned that cancer of the womb commonly commences with flooding, but this symptom is not peculiar to it; the disease may arise from polypus or other tumors of the womb, or from chronic inflammation of the same part, attended with softening. But when any unnatural discharge of blood take place between the periods of the menstrual discharge, or after its final cessation, no time should be lost in seeking the best medical advice.

Great relief may be obtained by the judicious administration of narcotics, and the patient may be rendered comparatively comfortable by thorough cleanliness and the free use of disinfectants.

The removal of the diseased growth by a surgical operation is sometimes advisable in the early stages of the malady, but this is a matter that must be left to the decision of competent authority in each individual case.

Prof. Thomas, one of our best authorities on diseases of women, gives the following suggestions for those who are afflicted with this malady:

"The relief of pain should be accomplished by the free, unrestricted use of opium by the mouth, the rectum, the vagina, or under the skin. I often encourage my patients to become opium-eaters, and urge them to obtain as complete relief as the use of this drug can afford. In place of opium other narcotics may be tried, but there is none which compares with it for efficiency.

"When opium produces the painful results noticed where an idiosyncrasy exists against it, the persistent use of it will often effect a tolerance.

"The fetor of the discharges may be, to a great extent, corrected by the use of vaginal injections containing disinfectant substances in solution. Solution of carbolic acid from one to two drachms to a pint of water, Labarraque's solution of soda in the same proportion, one drachm of powdered persulphate of iron to the pint, or a weak solution of the iodide of lead, will prove very useful. Of all these, carbolic acid is the most certain and effectual.

"The general strength should meantime be maintained by fresh air, residence in the country, generous food, alcoholic stimulants, iron and bitter tonics, while the mind should be kept cheerful by lively company and avoidance of the society of those who encourage conversation concerning the existing disease. As the digestion is weak, the most digestible substances should constitute the staple diet; and very often a patient who will become emaciated upon solid food and a mixed diet will improve upon the exclusive use of milk, beef-tea, and similar substances. So marked is this fact, that the milk diet strictly adhered to has been regarded, and is now by many non-professional persons, as a cure for cancer."

CANKER, CANCRUM ORIS. (See *Mouth, Diseases of.*)

CANELLA BARK.

Canella bark is tonic and aromatic; it is seldom given alone, but is found useful in preventing griping from aloes, senna, and other strong remedies, and also tends considerably to cover their disagreeable taste. In people of sedentary habits, who are troubled with indigestion, attended with constipation of the bowels, canella is a very efficacious medicine in conjunction with aloes. It enters into the composition of *hiera picra*, an old and well-known popular remedy. The *ramier*, or wood-pigeon, so well known in Dominica and other islands of the West Indies, derives the agreeable aromatic and bitter flavor, for which it is so much admired, from feeding on the berries of the canella tree, which is common in those islands, where it is known under the name of the wild cinnamon tree. The dose of canella bark is from ten grains to half a drachm.

CARBOLIC ACID.

This remedy, which a few years since was not heard of, is now growing into popularity with remarkable rapidity. There are those who predict that it will have its day and be forgotten. This is not probable. It possesses real merits, and of a high order, and will be permanently used. It may be regarded as the twin of *bromide of potassium*, for it came into popular use about the same time, and both are now consumed by the ton.

Carbolic acid was first employed in the form of coal-tar, in 1859, by MM. Corme and Demeaux.

The great fact about carbolic acid is that it is a *disinfectant.* In appearance and in smell it much resembles *creosote*, but it is less disagreeable, and is more useful.

Carbolic acid is used internally and externally. It is used externally and locally for *gangrene*, for *ulcers*, for *skin diseases*, for *chronic inflammations* of mucous membranes (rhinitis—catarrh of the nose), sore throat, whites, clap, piles, &c. It is used internally for *chronic diarrhœa*, *intermittent fever*, *&c.* It is used in the form of inhalation for *coughs*, *colds*, *and consumption.*

As a disinfectant, it is used in surgery and by sanitary authorities.

CARBUNCLE.

Carbuncle may appear without constitutional disturbance, but in general it is preceded by loss of appetite, foul tongue, headache, lassitude, general uneasiness, and shivering. At first it can scarcely be distinguished from a common boil, commencing in the form of a pimple, which gradually enlarges and becomes hard, broad, and elevated. The tumor is circumscribed and flat, the skin of a dark red or violet color; the hardness or firmness which accompanies it is compared to that of brawn; it is hot to the touch and very painful, with a sensation of burning heat, and a disagreeable feeling of stiffness. A carbuncle may not go beyond the size of a hen's egg, but sometimes it becomes as large as a saucer, or may even attain a diameter of eight or nine inches. The accompanying symptoms are, hot skin, thirst, severe headache, restlessness, high-colored urine, and other feverish symptoms. When left to itself it softens at the most prominent part, and little vesicles or bladders form, which burst and discharge a small quantity of a bloody, badly formed and fetid matter. The softening goes on, the openings increase in number, enlarge, and run into each other. The matter now discharged has an appearance which Sir Astley Cooper says is peculiar to carbuncle, and which he compares to flour and water mixed together. The skin between the openings is gradually destroyed and sloughs off, allowing the cellular substance or fat which the tumor contains to be easily seen. This substance is in a state of mortification, though it does not appear black, in consequence of being saturated with matter which gives it a grayish or ash color. The smell exhaled is strong and very disagreeable. Carbuncle commonly goes on to mortification in the course of ten days from its commencement, and the dead parts are thrown off towards the end of the fourth week, leaving a deep cavity which requires a considerable length of time to fill up and heal. An ugly cicatrix is invariably left.

Children and robust people are most subject to boils, several of which may exist at the same time; but carbuncle appears alone, and elderly people, whose constitutions have been impaired by improper living, are most subject to it. Carbuncles are seldom seen on the limbs: the parts which they generally attack are the back, particularly between the shoulder-blades, the loins, the nape of the neck, and hips, though they are occasionally met with on the belly and over the chest. Carbuncle generally terminates favorably, but is a disease by no means unaccompanied with danger; the risk attending it depends upon the age, constitution, and previous habits of the individual, as well as on its size, and the part which it attacks.

TREATMENT OF CARBUNCLE.

1. *A few incisions crossways, made early.*
2. The cauterization of the diseased part by nitrate of silver or caustic potash.
3. Poultices of yeast, charcoal, and port wine.
4. Tonics and stimulants, and nourishing food.

There is frequently great debility and exhaustion. Therefore every means must be used to sustain and strengthen the system.

CALISAYA BARK.

This is a species of cinchona bark with which every one is familiar. It is now exceedingly popular. It is frequently given in combination with pyrophosphate of iron. It is an ingredient of Caswell's celebrated tonic preparation.

CASCARILLA BARK.

This country is supplied with cascarilla bark principally from the Bahama Islands. It is an excellent tonic and stomachic, without being astringent, and was much used before the discovery of quinine as a remedy in ague, particularly in cases in which the Peruvian bark could not be given without producing sickness at stomach and purging. In simple indigestion, arising from weakness of stomach, cascarilla is one of the best and most grateful tonics that can be administered; it is also very useful in checking purging when not caused by inflammation.

An agreeable sensation of warmth in the stomach is produced by this medicine, which never causes vomiting, and is easily digested. Quinine has now, however, in a great measure, superseded the use of cascarilla, canella, and other tonic barks. Cascarilla, when burned, gives out an agreeable aromatic odor, and is on this account used as an ingredient in pastiles, and some people smoke a little of it along with tobacco. The dose of cascarilla, in powder, is from ten to thirty grains; and the dose of the infusion, which is the best method of using it, is from two to four table-spoonsful. "Take of cascarilla bark, bruised, an ounce and a half; boiling water a pint; macerate for two hours in a vessel lightly covered, and strain."

CASSIA. (*Cassia fistula.*)

The cassia tree is cultivated in Jamaica, and its pods, which are about a foot and a half to two feet in length, are imported into this country from the West and East Indies. The pulp of the pods mixed with manna, pulp of tamarinds, and syrup of roses, form the confection of cassia of the pharmacopœia, which acts gently as a laxative, without producing irritation of the bowels or griping, and is therefore well suited for old people and children. It is given in doses of from two drachms to an ounce.

CASTOR OIL.

Castor oil is obtained from the seeds of the Palma Christi, a plant which grows in great abundance in nearly all warm climates. Cold-drawn castor oil is brought to this country from the East Indies, where it is prepared by pressing the seeds without the aid of heat. It is of a pale straw-color, possesses very little smell, and its taste, though not strong, is mawkish and disagreeable. The West-India castor oil is prepared by boiling the seeds in hot water, and skimming off the oil as it rises to the surface; it is of a darker color than the East-India oil, has a disagreeable odor, and is apt to produce griping. The best East-India castor oil acts quickly as a mild purgative, seldom producing griping or constitutional disturbance; hence it is considered the best purgative in all inflammatory affections of the bowels, in colic, piles, the dry belly-ache of the West Indies, and habitual costiveness. There is no better laxative than this oil for children, and for females during pregnancy. When a person is in the habit of taking purgative medicine, it is in general found necessary to increase the dose; the reverse of this, however, is the case with castor oil, the doses of which may be gradually diminished, hence the advantage of it in the treatment of habitual costiveness. In the East Indies it is used externally in the treatment of gout and rheumatism, by rubbing it into the parts affected, and then covering them well with flannel. Various plans are adopted to cover its nauseous taste; some take it with warm milk, others prefer it floating in a little spirit. One of the best methods is to beat it up with the yelk of an egg, and then add gradually a little cinnamon or peppermint water, or a little plain water, with two teaspoonfuls of the tincture of cardamoms, to prevent sickness at stomach. It may be given to very young children in the dose of half a teaspoonfuls to two or more teaspoonfuls, according to the age. For a grown-up person the dose is one, two, or three tablespoonfuls.

CATALEPSY, OR TRANCE.

Catalepsy is a disease of the nervous system, of an intermittent nature, and recurring in fits at irregular intervals. It is characterized by the sudden and complete suspension of consciousness and voluntary motion; the body and limbs retaining, throughout the fit, the position in which they were at the moment of the attack; or any other position which may be given to them during its course. Females are most subject to this rare and singular disease. Many theories have been proposed to account for its extraordinary symptoms, but none of them are satisfactory, and its nature remains still unknown.

Hypochondriacal and hysterical women, and those with irritable nervous systems, appear to be most predisposed to this disease. Habitual melancholy, religious enthusiasm, love, great anxiety, extreme sorrow, and other passions which act strongly on the nervous system, are supposed to be predisposing causes. The immediate exciting causes are anger, terror, sudden fright, or any strong mental emotion. In some instances it would appear that catalepsy depended, at least to a certain extent, upon irritation of the brain or spinal marrow, a deranged state of the stomach and bowels, obstruction of the menstrual discharge, and other irritating causes: but individuals have been affected with it in whom no other disease could be detected, though in the majority of cases it seems to have been intimately connected with hysteria. It is not a dangerous disease, but there is reason to believe that in some instances individuals have been buried while in a cataleptic state.

TREATMENT OF CATALEPSY.

This disease is so very rare that the treatment may be dismissed in a few words.

There is no specific for the disease. During the attack little or nothing needs to be done. The patient who is subject to attacks of catalepsy should receive *tonic* treatment—outdoor air, sunlight, nourishing food, plenty of sleep; and internal tonics, such as iron, strychnine, quinine.

General electrization would probably be useful in such cases. (See *Nervous Diseases* and *General Electrization.*)

CATARRH OF THE NOSE, OR RHINITIS.*

For the past ten or fifteen years there has been scarcely any disease (excepting, perhaps, the venereal) that has brought in so rich and abundant a harvest to charlatans as the inflammations of the nose and pharynx. Gentlemen who in all other matters are prudent, judicious, and reliable, suffer themselves to be robbed in purse and health, if not in life, in order to win a doubtful chance of being relieved of long-standing "catarrhs" at the hands of those who do not even desire to comprehend the simplest principles of pathology.

But that good and true citizens are thus deceived, is rather the fault of the profession than of themselves. In the desperation of self-defence, they are compelled to consult those for whose attainments or principles they have no respect.

Although rhinitis is not usually absolutely painful, it is yet in many cases intensely harassing, and embitters existence far more than very many diseases that have called forth the best energies of the profession. It has been stated that rhinitis is a very frequent form of disease. It might be said with propriety that it is universal. Neither sex and no age is free from liability to attacks of acute rhinitis, and at least a majority of those who dwell in our northern climate are affected more or less, at some time of their lives, with the sub-acute or chronic form, though it may not necessarily be so severe or long continued as to call for treatment.

Causes.—The one great cause is, of course, exposure to cold. Sitting in a draught of air, premature removal of the under-clothing, wetting the feet, and all the various circumstances that conspire to close the pores of the skin, may bring on an acute attack of rhinitis within a few hours.

In the vast majority of cases these attacks pass off either with or without treatment, leaving behind no unpleasant consequences.

But oftentimes one cold follows so closely after another, that the mucous membrane of the nasal passages does not have time to recover its normal condition. Consequently it becomes weakened by repeated attacks, and the inflammation may take on the sub-acute form.

This in turn may pass away, leaving the mucous membrane, however, in a more susceptible state than is natural. But if, on the other hand, the individual be of a scrofulous or delicate habit, with a mucous membrane throughout relaxed and flabby, the inflammation may very slowly go on to the chronic stage, hastened in its advance by each repeated chill. In those of firm, wiry constitutions, however, this chronic stage is not usually reached until after severe and frequently repeated exposure to wet and cold.

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* These remarks on Catarrh of the Nose are mostly taken from my Introduction to Tobold's *Chronic Diseases of the Larynx.*

The chief predisposing causes are confinement in over-heated rooms, and the eating and drinking of hot substances.

Those who labor or idle over registers or near hot stoves, are of necessity more susceptible to rhinitis, as well as to pharyngitis and laryngitis, than those who are more active and more uniformly exposed to outdoor temperature. Hot air, continually breathed in against the delicate mucous membrane of the nasal passages, renders it susceptible to acute inflammation whenever the system remains chilled for any length of time.

Exposure to night air is perhaps the most frequent, as well as the most powerful exciting cause of rhinitis, and one also that interferes with treatment more than almost anything else. Those whose occupation compels them to travel much by night, and particularly the *habitués* of late evening amusements, are very liable to suffer from rhinitis, and are very rebellious to any method of treatment so long as they remain unchanged in manner of life.

Smoking has long been a stone of stumbling and rock of offence to those afflicted with inflammation of the lining membrane of the air-passages. Hot smoke has a far more locally relaxing tendency than hot air, and when the two are combined, as always in the act of smoking, the pernicious effects are very marked. A perfectly healthy nose and pharynx, in an adult, is quite hard to find, and in habitual and excessive smokers there is always evidence of more or less chronic inflammation of these parts. Tobold is of the opinion that sitting in a room where much smoking is going on is more injurious to chronic laryngitis than the act of smoking. If this be true (and it is hard to prove or disprove the assertion), then it would seem that fumes of the tobacco smoke were chemically weakening to the tissues.

Hot drinks, including tea, coffee, liquors, unquestionably predispose to rhinitis, by first affecting the mucous membrane of the pharynx.

The great majority of cases of acute rhinitis, whether accompanied with pharyngitis and laryngitis or not, usually recover in a few days, and the patient goes on and forgets that he was ever afflicted. But now and then one attack supervenes on another so rapidly as to destroy the tone and recuperative power of the mucous membrane, and then the disease falls into the sub-acute, and ultimately into the chronic stage.

As a rule, the light-haired, fair-skinned, and delicate are especially liable to this, as to every other form of inflammation of mucous membranes; and yet some of the most obstinate cases of chronic rhinitis I have ever treated have been in vigorous, hard-working men, every way healthy in other respects. Farmers, day-laborers, and outdoor mechanics, with powerful lungs and muscles, and who have every function of every other portion of the body performed in absolute harmony, are often the victims of chronic rhinitis. But, as with nearly all other diseases, this also is more frequently the appanage of the poor and oppressed than of the cultivated and wealthy. When it attacks the weakly and scrofulous, it is apt to improve with the bettering of the general condition. Therefore children who suffer from rhinitis in early years often "out-grow it," as the grandmothers say, as they advance to maturity, and the enemy may never again disturb them. Cases, however, that ensue after measles and scarlatina are more likely to run a protracted course, and being always associated with pharyngitis, are sometimes difficult to treat, and the results are not as certain or as speedy.

But though the heirs of scrofulous parentage are particularly liable to this form of inflammation in all its stages, it has yet to be proved that there is any direct connection between rhinitis, or pharyngitis even, and tuberculosis of the lungs. The plausible idea that the disease will "work down" is a favorite theme with quacks, and is quite universally dreaded by the masses. But it is, I think, untenable. Pulmonary tuberculosis is very often associated with rhinitis, just as it is with conjunctivitis, but it is no more a consequent in one case than in the other.

What the issue will be in any given case, if entirely let alone, it is impossible to predict, for the disease seems to be a law unto itself. I have known quite severe cases to recover, absolutely and permanently, without any treatment whatever, even in persons of delicate and susceptible constitutions.

Sometimes there appears to be a metastasis of the affection. I have very recently treated a case of acute rhinitis, from which the patient had often suffered, and always apparently as a metastasis of rheumatism in the ankles.

It may remain stationary for years, or slowly grow worse and worse, until in old age it becomes at once incurable and intolerable.

But, after all, the chief thing to be dreaded in rhinitis is the extension of the inflammation into the upper part of the pharynx, and from thence through the Eustachian tube into the middle ear, with the long train of pathological results—obstruction of the tubes, chronic inflammation of the middle ear, sinking in of the membrana tympani—and the invariable consequence, *permanent hardness of hearing.* For this reason, if for no other, the attention of physicians should be directed to rhinitis and pharyngitis at their incipiency; and these very serious results should be forestalled by appropriate treatment.

After the mucous membrane of the nose has been once affected by chronic inflammation, and has been well cured, it will ever afterward be more or less susceptible to acute or sub-acute attacks, however careful or judicious the treatment may have been.

The *treatment* of catarrh of the nose consists in the application of very *weak solutions of chlorate of potash*, *carbolic acid*, *Lugol's solution*, *iodine and glycerine*, *tannin and glycerine*, *permanganate of potash*, and *nitric acid*, or other similar substances, by means of the nasal syringe and nasal douche. (See *Syringe* and *Nasal Douche.*)

No two cases can be treated exactly alike. The special remedy to be used and the strength of the solution must be determined by the progress of the case. Every family should know that for recent acute attacks *chlorate of potash* is almost a specific. Those who have no douche at hand can snuff of weak solutions of *chlorate of potash* through the nostrils several times daily, whenever they have a bad cold in the head.

Common salt is also a good remedy. The patent "*snuffs*" are rarely of service. Long-standing cases of catarrh cannot be cured in this way, but will need persevering treatment with the other substances mentioned above. In ordinary cases nothing *is gained by using painful applications.*

Some cases of chronic catarrh may be complicated with some morbid growth or other serious disease of the nostrils. Those who are so affected should obtain surgical advice.

Those cases that are accompanied by very offensive discharge and bad breath are susceptible of treatment, and may obtain much relief.

CATECHU.

Catechu is produced from a species of acacia, which grows in various parts of India. It is an excellent and very powerful astringent, and is frequently used for the purpose of stopping purging, when there are no inflammatory symptoms present, in combination with chalk mixture and laudanum. It is given to check gleet, whites, discharges of blood from the bowels and womb, and all immoderate discharges when not attended with inflammation. The dose of the powder is from ten grains to a drachm.

CAYENNE PEPPER, OR CAPSICUM.

Cayenne pepper is more used as a condiment to food than medicinally; it promotes digestion and prevents flatulence. The natives of warm climates, who live principally on vegetable food, mix with it a large quantity of the various kinds of capsicum, to promote digestion and give tone to the stomach; and this diet appears much better suited for those climates than the rich and stimulating dishes of animal food, with wine and spirituous liquors, on which Europeans generally live. The former kind of aliment appears intended by nature for the inhabitants of hot climates, since, without being either too exciting or irritating, it allows them to resist the action of *malaria*, or the effluvia from decaying vegetable and animal matter; and to avoid the fevers, dysentery, and other inflammatory diseases which cause the death of so many, in consequence of their indulging in the latter mode of living, which disposes to those diseases, and also renders them more frequently fatal than they otherwise would be.

Capsicum is at present extensively cultivated in Europe, and as it is now understood to possess all the virtues of the oriental spices, without producing any of their bad effects, has in a great measure superseded their use. In fact there is at present no other stimulating vegetable substance so much in use in the seasoning of food as this; it is extensively used in the preparation of pickles; and vinegar which has acquired a sufficient degree of pungency from the pods of the bird-pepper (Chili vinegar), is considered the most wholesome and one of the most agreeable things that can be used with all kinds of fish.

From a drachm to two drachms of the tincture of capsicum, with half a pint of water, form an excellent gargle for malignant sore throat; and Chili vinegar diluted with water is also used in the same manner in relaxed sore throat, with elongation of the uvula. Poultices of the bruised pods of capsicum are much employed in the West Indies, instead of mustard poultices; they are equally powerful, and not so apt to blister the parts. Cayenne pepper with brandy, in strong doses, frequently repeated, is the best remedy that can be used for the purpose of counteracting the effects of the powerful narcotic poison from the land crabs of the West Indies. Cayenne pepper is sometimes used along with the preparations of iron, when there is obstruction of the menstrual discharge; and it is also used as a tonic in scrofulous and other chronic cases. It is more used as a medicine in tropical than in temperate climates. The dose of the powder is from six to ten grains, made up in pills; and that of the tincture is from ten drops to a drachm, in barley-water. The tincture is prepared thus: "Take of capsicum, bruised, five drachms; proof spirit, a pint; macerate for fourteen days, and strain." *It is good in sea-sickness.* (See *Sea-sickness.*)

CHALK.

Chalk is principally employed in medicine for the purpose of checking purging, from acidity in the stomach and bowels. It is mild in its action, and well suited for children. The dose of prepared chalk in powder is from fifteen to thirty grains, but it is usually given in the form of the chalk mixture. "Take of prepared chalk, half an ounce; sugar, three drachms; mucilage of gum arabic, an ounce and a half; cinnamon water, eighteen fluid ounces; mix. The dose is from two to four tablespoonfuls every three or four hours." The compound powder of chalk is used for the same purpose, and is prepared as follows: "Take of prepared chalk, a quarter of a pound; cinnamon, two ounces; tormentil and gum arabic, of each an ounce and a half; long pepper, a quarter of an ounce; rub them separately to a very fine powder, then mix them. Dose from five to thirty grains." The utility of these preparations of chalk is increased by giving along with them a little laudanum, catechu, or kino.

CHAMOMILE FLOWERS.

Chamomile is an excellent stomachic, and is one of the best popular remedies in common use. Those who suffer from heartburn, flatulency, loss of appetite, and other symptoms of indigestion, may find much benefit from cold chamomile tea, with a little powdered ginger, taken early in the morning. The cold infusion, which is the best and most agreeable way of using it as a tonic, is made with half an ounce of the flowers to a pint of cold water. If the warm infusion be preferred, care should be taken in preparing it not to allow the flowers to remain with the water longer than ten minutes. When there is nausea in consequence of the stomach being overcharged with food, a strong infusion of chamomile taken warm acts as an emetic; and it is often given to assist the action of other emetics. The flowers steeped in hot water and wrapped in flannel retain the heat a long time, and are therefore very useful as a fomentation. The extract of chamomile is serviceable as a tonic, in doses of from eight to sixteen grains: it is usually combined with a little myrrh and a preparation of iron.

CHEMICAL FOOD.

Of late years use has been made of *lime* and *phosphorus* in the form of "chemical food," as it is termed. It is given on the theory that the system sometimes needs these substances in greater quantity than they can be obtained in ordinary food. The question is not yet settled in the profession whether the system can be well nourished by giving these pure chemicals. It is supposed by some that phosphorus, iron, lime, &c., can only be assimilated when they are given in organized substances.

Prof. Horsford has popularized a method of bread-making which gives more phosphorus to the flour during the preparation. (See *Bread*, under *Food.*)

CHICKEN-POX.

This disease has been so seldom met with in grown-up people, that it may be considered as peculiar to children. It is a disorder of very little importance, though at the commencement it is often a source of considerable uneasiness to parents, who think that their children have caught small-pox; and indeed it is sometimes no easy matter to distinguish chicken-pox from the mild or modified small-pox, so frequently observed since the introduction of vaccination.

The eruption of chicken-pox generally makes its appearance without symptoms of fever, though it is not unfrequently preceded by headache, drowsiness, foul tongue, sickness at stomach, and slight increase in the heat of the skin and quickness of the pulse; but these symptoms seldom continue longer than twenty-four hours. The eruption is generally first observed either on the breast, or all over the body, at the same time. The pocks are distinct, irregular in shape and size, though for the most part they are oblong, or of an irregularly circular form, and vary from the size of the head of a pin to that of a split pea. They are filled, on the first day of their appearance, with a clear inodorous fluid, are accompanied with a sensation of itching, and there is a red margin round the base of each. On the second or third day, the pocks or vesicles, which are formed merely by the elevation of the scarf-skin, begin to burst of their own accord, or are broken; and on the third or fourth day the fluid in those that remain entire acquires a straw-colored appearance, and soon dries up, leaving crusts which crumble away gradually, or fall off in scales about the fifth or sixth day, without leaving pits or any other appearance, except a little redness, which soon disappears. It ought to be remarked, however, that all the eruption does not come out at the same time; there are successive crops of vesicles, and while some are just appearing, others are in a state of maturity, and at the same time crusts may be here and there observed. During the progress of the eruption the general health is little or not at all affected, the sleep is not disturbed, nor the appetite impaired.

Chicken-pox cannot be propagated by inoculation. It is quite independent of small-pox and vaccination, and may come on before or after them, nor does it in the slightest degree interfere with the regular progress of cow-pox.

Chicken-pox is a disease of so mild a character that it cannot easily be mistaken for small-pox, which is a very serious, and frequently a fatal disease. It may be well, however, to point out the difference between it and the mild or modified small-pox, with which it is more likely to be confounded. There is little or no fever before the appearance of chicken-pox; the skin round the pocks is red; they are filled with a clear fluid on the first day of their appearance; and they have neither a hardened base nor central depression, and, when punctured, they fall to the level of the surrounding skin. In modified small-pox there is always fever, accompanied with severe headache, and sometimes delirium, during at least forty-eight hours before the eruption, which appears first on the face in the form of hard pimples, surmounted with small circular vesicles, containing matter, and depressed in the centre. The scabs or crusts are always considerably raised above the level of the skin, and when they fall off leave small hard swellings, which disappear slowly. There is still another distinction between small-pox and chicken-pox: the former, whether modified or not, is highly contagious; whereas the latter is not considered to be so.

Treatment.—This disease is of so harmless a character that it may be safely left to nature. A little castor oil, or rhubarb and magnesia, may be given if the bowels be constipated, and the patient should not be allowed to eat animal food for a few days.

CHAPPED HANDS.

Chapped hands are very common and very disagreeable. At certain seasons of the year when high winds blow, some persons are much annoyed by chapping and cracking of the hands, lips, and fingers.

The treatment of this affection is very simple. Use compound tincture of benzoin, glycerine, equal parts, one, two, or three times a day, as may be convenient. Glycerine alone will answer. If we make the application but once a day, let it be before retiring.

CHILBLAINS.

Chilblain is a name given to a species of inflammation which arises from exposure to a severe degree of cold. The parts most frequently attacked by it are the fingers and toes, particularly the little finger and little toe, and the heels; the extremity of the nose, the tips of the ears, and the cheeks are also sometimes affected with it. A chilblain, in the first or mildest degree, is neither accompanied with pain nor heat, unless the part affected be kept near the fire, or be influenced by the atmosphere of a warm room, and then it becomes only a little warmer than natural, with a peculiar sensation of itching and tingling, which is troublesome and disagreeable, though it cannot be called painful; but there is always more or less swelling of the part, and the skin has a livid or purple color. In the second degree of this affection there is considerable heat, pain, and swelling, and these symptoms are occasionally so severe as to deprive the person of the use of the parts; the hands of young ladies, for example, are sometimes so swollen and painful that they cannot write or play on the piano-forte; and, in fact, are for a time rendered incapable of doing anything requiring the free use of the joints. In the third degree, little vesicles or blisters rise on the surface of the chilblain, which break and discharge a thin brownish-colored fluid. A raw surface is thus exposed, and sores are produced which give out an acrid matter that irritates the surrounding parts; and the ulceration, if not checked, penetrates deeply, and destroys the soft parts, even as far as the bones.

Children, females, delicate individuals with fair complexion and tender and irritable skin, and those of a scrofulous habit of body, are most liable to chilblains. They are frequently brought on by the bad habit of sitting near the fire immediately after coming out of a frosty atmosphere, with the feet and hands benumbed from cold; and they are just as likely to be produced by quitting a warm apartment suddenly and going out into the cold air, particularly if the feet and hands happen at the time to be slightly moist from perspiration.

Treatment.—Stimulating applications are found to be the most efficacious in curing chilblains. One of the best liniments in general use is composed of an ounce of *camphorated spirit of wine*, mixed with half an ounce of *Goulard's extract.*

The proper treatment for *broken or ulcerated chilblains* is, in the first instance, to apply warm poultices of bread and milk, or linseed-meal, which are to be discontinued after two or three days, and the tincture of iodine applied. The ulcers, and all the discolored skin surrounding them, are to be moistened with it once a day, and then dressed with basilicon ointment spread on lint or on a piece of soft linen rag. Lunar caustic, in the proportion of from five to ten grains to the ounce of water; and a drachm of red precipitate, mixed with an ounce of basilicon, are useful dressings for broken chilblains. When the sores assume a healthy appearance and begin to heal, these stimulating applications must either be made very much weaker or discontinued altogether, and basilicon or any simple dressing substituted for them.

Persons whose feet and hands become chilled and benumbed from exposure to a moderate degree of cold, should avoid sudden vicissitudes of heat and cold as much as possible; they should take regular exercise in the open air, having the extremities of the body well protected by warm clothing; and if those parts should become chilled from exposure to cold, care ought to be taken to restore the heat gradually by friction, by means of warm water or otherwise, and not to expose them to the fire or to sudden heat. Those who are subject to chilblains should take care, after washing the hands and feet, to dry them properly, and not leave them in the slightest degree moist; and during the winter months they should avoid washing the hands in cold water. Bathing the feet and hands every night in warm water, with some common salt dissolved in it, is one of the best means of preventing chilblains.

CHLORAL, HYDRATE OF.

As the second edition of this work is going through the press, the profession, both in this country and in Europe, are enthusiastically investigating a new remedy called *hydrate of chloral*. At first it was believed that it would take the place of chloroform. It seems to combine some of the good effects of chloroform and bromide of potassium, being weaker than the former, but much more powerful than the latter, and keeps the patient a much longer time under its influence.

It is believed that it will be a valuable and permanent addition to our list of remedies for the treatment of neuralgia, delirium tremens, convulsions, sleeplessness. During my visit abroad this summer, I found that it was exciting great interest in Germany, France, and England, and quite a number are now experimenting with the remedy in America.

CHLORATE OF POTASH.

This remedy is of recent introduction, and is of very great value.

For acute *inflammations of the mouth and throat* it is almost a specific. In *salivation* from the abuse of mercury it is also excellent. In *ulcers* of the tongue and mouth, for sore gums, it is, perhaps, the best remedy we have. In acute colds in the head, accompanied by profuse discharge, or a sense of stoppage—what is known as coryza, rhinitis, cold, catarrh—it is a specific. It should, in such cases, be injected into the nares with a posterior nasal syringe.

When given internally, it is believed to impart oxygen to the blood.

Doses.—It may be given in doses of from *five to thirty grains* dissolved in hot water, before meals. The solutions for gargling the throat or injecting the nasal passages may be of almost any strength—say, one teaspoonful to one tumbler of tepid water.

CHLOROFORM.

This fluid was discovered at about the same time by Mr. Guthrie, of Sackett's Harbor, N. Y., and Soubeiran, of Paris, in 1832.

In 1847 Dr. Simpson, of Edinburgh, first used it as a substitute for æther. In a short time it became known all over the world. It has some advantages over ether.

1. *It is more rapid.* It will sometimes produce insensibility in a few seconds.

2. *It is more effectual.* It succeeds after æther and laughing-gas have failed.

3. Its odor is less disagreeable.

On the other hand it *is more dangerous* than æther. Neither of them should be given to patients except by a competent physician, or by one who is practically familiar with their effects and the rules for their administration. When a sea-captain or miner is compelled to use some agent to benumb sensibility, he should by all means prefer æther.

Many deaths—certainly several hundred—have happened from the use of chloroform, even in the hands of skilful physicians.

It is believed by some that the mortality after *surgical operations is greater since the introduction of chloroform* than before. The question is a difficult one to decide.

Chloroform is given in childbirth with very good results.

When it began to be used for this purpose it met with silly and absurd opposition, on the ground that the Bible enjoined that woman should *bring forth children in sorrow.* It was wickedly claimed that woman ought to suffer all the pains that were sent upon her. This monstrous and criminal doctrine was proclaimed not only by fools and idiots, but by men who on other subjects were entirely rational, and even by physicians. Chloroform or æther, when skilfully given, affords great relief in the agonies of childbirth, and by many practitioners is used almost habitually.

No case of death from the use of chloroform at childbirth is on record. Two ladies, however, died while inhaling chloroform on their own responsibility, during the absence of the physician. It is claimed by some that chloroform at childbirth produces "exhaustion, hemorrhage, fever, and inflammation and cerebral disturbance." On this question professional opinions vary.

Chloroform is also given *in locked-jaw*, *in asthma*, *in convulsions*, *in St. Vitus's dance*, *in delirium tremens*, *in neuralgia*, *in toothache*, *in sleeplessness*, and in all the forms of *pain.*

It is at best a dangerous agent. It should only be used when necessary, and when æther fails. Neither of them should be taken habitually. Neither of them should be inhaled by any one alone, without a responsible attendant. Even a physician cannot with safety use the agent on himself. The risk is too great. Deaths are continually occurring from carelessness in the use of these agents.

If we must use æther to relieve our *headache*, *neuralgia*, or other *pain*, let it be administered by some responsible attendant, if a physician cannot be obtained.

If bad symptoms occur—pallor, suspension of breathing—use artificial respiration as directed in the chapter on surgery, electricity through the chest and neck, and dash cold water on the head.

Doses.—Chloroform is best given by a handkerchief formed like a funnel, so that the patient may breathe common air at the same time. The dose varies with the temperament. In midwifery, neuralgia, simple insensibility is all that should be attempted. This may be accomplished oftentimes by a few drops of chloroform. In surgical operations the patient must be made unconscious. From one to four or five drachms is sometimes necessary.

Chloroform is given internally for a large variety of diseases, but not with uniform success. It is also applied locally for neuralgia, sprains, &c.

CHROMIC ACID.

This acid has been recently substituted for nitric acid and nitrate of silver. It is frequently applied to the womb, for the cure of inflammation and ulceration.

It must be applied with care, by means of a glass rod.

CHOLERA.

Cholera is generally divided into two species—cholera morbus, and the Asiatic cholera.

Cholera morbus occurs in every country and at all seasons of the year, though it is most common in warm climates, and when the heat is greater than usual. It generally commences with griping pains in the belly, and sickness at stomach; and these symptoms are soon followed by frequent vomiting and purging. The food in the stomach is first discharged; then a fluid, varying in color, but always containing bile, is thrown up in great abundance; the evacuations from the bowels also contain bile, and are voided with considerable straining, heat, and pain at the lower bowel. There is at the same time a violent pain at the stomach; and the belly, and in some cases the calves of the legs, are contracted by strong spasms, which recur at short intervals, accompanied with great pain. These distressing symptoms are attended with much anxiety, restlessness, and a sensation of burning heat at the stomach, with urgent thirst and severe headache; and the pulse, which is at first full and rather quicker than natural, becomes feeble and rapid as the disease proceeds; and the patient's strength diminishes. In ordinary cases these symptoms abate of their own accord, or are checked by the assistance of remedies in the course of a few hours, or they may continue during two or three days, and then cease gradually. But in the more severe cases the symptoms acquire a more alarming character. The vomiting and purging become almost constant, and the matter vomited is sometimes watery, frothy, or slimy, and only occasionally mixed with bile; but that fluid in a highly acrid state forms always a part of the discharge from the bowels, and this appears to be one of the most marked distinctions between the common and the Asiatic cholera, in which the stools do not contain bile. The body and limbs are covered with cold sweat; the muscles of the belly are frequently contracted, and drawn into knots by violent spasms, which also attack the legs, the thighs, and even the hands and arms. If the progress of the disease cannot be arrested, the face soon becomes deadly pale, shrunk, and expressive of the greatest pain. The eyes appear sunk in their orbits. The extremities of the body become cold, and the pulse weak and intermitting. Sometimes the patient recovers even after the disease has advanced to this extent; but in general the strength diminishes rapidly, frequent faintings, laborious breathing, and hiccup supervene; and death is then inevitable. If from the unaided efforts of nature, or from the judicious use of medicine, the stage of collapse or sinking, which has just been described, be prevented, the symptoms, after a longer or shorter period, varying from six to forty-eight hours, usually abate suddenly, and not in the gradually decreasing manner in which recovery takes place from inflammatory diseases; the skin assumes its natural warmth; the pulse becomes more full and less frequent; the vomiting, purging, and cramps cease; and the patient, though very weak, remains quiet, and free from pain. No disease reduces the strength so quickly as cholera, nor is there any other of so violent a character from which recovery is so rapid. Convalescence, however, when proceeding in the most favorable manner, is often abruptly terminated by the imprudence of the patient, who, finding himself completely rid of the disease, and his appetite again in full vigor, indulges in eating animal food, and in consequence all the symptoms are reproduced, and soon become less manageable than before; or inflammation of the stomach and bowels comes on, which supervening on cholera, generally runs on to a fatal termination in spite of the best conducted treatment.

Cholera morbus has always been observed to be most prevalent when the weather is hot during the day, and cold and moist at night; and the frequency of its occurrence as well as its severity appear to depend on the degree of heat and humidity of the atmosphere.

Cholera morbus is easily distinguished from other diseases by the sudden manner in which it commences, the quickness of its progress, and abrupt termination. The symptoms arising from swallowing acrid poisons, such as arsenic, vitriol, corrosive sublimate, &c., have in most cases a strong resemblance to those of cholera morbus; but the burning sensation extending from the throat down the gullet to the stomach, before the commencement of vomiting; the frequent occurrence of violent vomiting, some hours before the bowels are acted on; the dark, bloody appearance of the matter vomited; and in general the absence of cramps; are signs which sufficiently indicate poisoning from irritating substances.

TREATMENT OF CHOLERA MORBUS.

1. Mustard plaster over pit of stomach.
2. The following prescription:

Tincture of capsicum,
Tincture of opium,
Spirits of camphor,
Tincture of ginger, equal parts.

Give from 20 to 60 drops in water every half hour, until the pain is relieved.

Or this prescription:

Tincture of rhubarb,
Tincture of ginger,
Tincture of opium,
Peppermint water, equal parts.

Give in same doses as the preceding.

This treatment alone will usually afford relief in two or three hours.

3. In the last stages inject into the rectum one ounce of starch and 50 drops of laudanum, and give brandy internally.

CHOLERA MIXTURES.

Cholera morbus and Asiatic cholera are continually liable to disturb us. It is well, therefore, to be provided against all the emergencies

Of late years various modifications of so-called cholera mixtures have been used with success.

One form is this:

Syrup of ginger,
Laudanum,
Tincture of capsicum,
Tincture of rhubarb,
Spirits of camphor, equal parts.

Dose from 20 to 60 drops in water every half hour, until relief is afforded.

Another form:

Chloroform,
Tincture of rhubarb,
Spirits of camphor,
Laudanum, equal parts.

Dose same as for the first.

The power of these mixtures to relieve the griping and vomiting of cholera morbus is very decided.

ASIATIC CHOLERA.

This disease is said to have commenced in 1817 at Jessore, a town situated near the mouth of the Ganges, about sixty miles from Calcutta. It soon extended throughout the entire province of Bengal and the neighboring territories, and in the course of the following year reached the utmost limits of the Indian peninsula. It devastated China, the Birman empire, and adjacent countries in 1820; and in the two following years extended to the numerous islands of the Indian ocean, and also to Arabia, Persia, and the borders of the Mediterranean in Syria. In 1823 it ravaged many towns in the Russian dominions. In 1829 it crossed the Don and the Ural mountains, and appeared in Europe; at Moscow in 1830, and at St. Petersburg in 1831, and then accompanied the Russian army into Poland. In the same year it pursued its frightful career in Egypt, Austria, Hungary, Bohemia, and Prussia, and in the month of October appeared at Sunderland. In 1832 it continued its destructive course to London and Paris. In 1833 it crossed the Atlantic, and raged in the United States of America, Canada, and in the island of Cuba, but did not extend to the other West Indian islands. It subsequently visited the south of France, Portugal, and Spain; and broke out at Naples and Rome in 1837, in which year it disappeared entirely. More than half of all those who were attacked perished; and it is supposed to have carried off at least fifty millions of people. It visited the United States in 1832, 1849, 1850, 1854, 1865, and 1866.

The nature of the Asiatic cholera still remains a mystery. Nothing satisfactory has yet been found out with regard to the specific cause, nor has the part of the body in which the disease originated been ascertained; and whether or not it is contagious is still a question at issue. There is no doubt, however, that people in easy circumstances of life, who have been well fed and clothed, and live regularly, are less liable to it than those who subsist on poor diet and are addicted to drinking spirits.

This disease in the majority of cases commenced with slight giddiness, a feeling of languor and general debility, an uneasy sensation of fulness, heat, and sickness at stomach, flatulent noises in the bowels, and frequent purging, which was the most prominent symptom of the premonitory stage. These symptoms lasted only a few hours in some cases, in others they continued during three or four days; and when they ceased spontaneously or were checked by timely treatment, the disorder was termed by the French *cholerine*. But it frequently happened that these warning symptoms were neglected or could not be arrested, and the disease ran its course; and in many cases the patients without any previous notice were struck down suddenly and died in the course of a few hours. When it came on suddenly the patient was seized with uneasiness or pain at the stomach, quickly followed by retching and vomiting. The contents of the stomach were first thrown up, and then a thin fluid, characteristic of the disease, resembling rice-water, was discharged in great abundance both upwards and downwards. These symptoms were either accompanied or soon followed by a sense of constriction, anxiety, and weight upon the chest; great restlessness; quick and laborious breathing; and painful spasms beginning first at the fingers and toes, and then extending to the arms, legs, and muscles of the belly, and in many cases to the loins and lower part of the chest. There was a burning sensation at the stomach, and dryness of the throat with great thirst, though the tongue remained cool and moist; and the discharge of urine was entirely suppressed. The strength gave way rapidly; the pulse became quick, weak, and at times scarcely perceptible; and the voice was husky, peculiarly plaintive, or almost extinct. As the disease approached a fatal termination, the extremities became cold and shrunk; the fingers and toes appeared corrugated, as if they had been long immersed in warm water; the surface of the body was covered with cold sweat; the eyes were sunk and surrounded with a livid circle; the face, the hands and feet, and in many cases the whole body, acquired a blue or purple color, and the pulse could no longer be felt at the wrist. When the patient recovered, reaction took place, the heat gradually returned to the surface of the body, all the bad symptoms ceased, urine was again discharged, and bile made its appearance in evacuations from the bowels; but instead of this favorable termination it often happened that reaction was followed by fever, which frequently proved fatal. After death, which generally took place in from six to twenty-four hours, the fingers, toes, and lower jaw were in some instances seen to move; and even the head was observed to shake, and the legs to approach each other. This extraordinary phenomenon has never been known to follow death from any other disease.

CAUSES OF CHOLERA.

The cause of cholera has been a subject of much discussion. The view which is now considerably received is that of Pettenkofer. He holds that cholera spreads through the "rice-water" discharges. It either exists in them or is formed in them. The contagion, therefore, comes from one patient to another through water-courses, above or under ground, and "possibly in the form of dry dust in the air."

Therefore the stools of patients should be promptly disinfected by chloride of lime, Labarraque's solution, dry earth, peat, sulphate of iron, &c. (*See Disinfectants.*) . The house should be thoroughly fumigated and disinfected. The cellars should be white-washed. Chloride of lime should be placed in pans or saucers in various parts of the house. Chloride of lime, dry earth and peat, &c., should be kept in the privies. All foul clothing should be washed, disinfected, or burned.

Besides all these *general* measures, which should be adopted by the city and town authorities and by the master of every household, every individual should see to it that his own health is preserved, by obedience to the acknowledged laws of health. (See *Hygiene.*)

Above all things never be frightened, for fear brings on a multitude of diseases.

Every possible precaution for preventing, as well as every probable means of curing the disease, should be familiar to the public as well as to the medical profession. In many parts of the country professional aid cannot be obtained at all; in other parts a disastrous delay must necessarily occur. The disease is sudden in its attack, rapid in its progress, and, according to statistics, in one case out of two, fatal in its effects. It is therefore only common wisdom to guard against it by unusual care, and to arrest the first symptoms by a prompt resort to remedies. The following rules, if strictly observed, will greatly contribute to personal security, and to check the epidemic:

1. Let immediate relief be sought in any disorder of the bowels, however slight: the invasion of cholera may thus readily and at once be prevented.
2. Let every impurity, animal or vegetable, be removed as soon as possible from human habitations.
3. Let all uncovered drains be frequently and carefully cleaned, and let the grounds around dwelling-houses be so drained as effectually to carry off the moisture that otherwise might be in excess.
4. Let all the rooms of the house be thoroughly ventilated every day when the weather is dry, and let dry scrubbing be substituted for wet.
5. Avoid exposure to damp and cold, and excessive fatigue.
6. Let the use of cold drinks and acid liquors, especially under fatigue, or when the body is heated, be avoided.
7. Avoid the use of cold acid fruits and indigestible vegetables.
8. Let excess in ardent or fermented liquors, and the use of impure water in cooking or drinking, be avoided.
9. Use a healthy and nourishing diet that will preserve the strength of the body, and enable it to resist as far as possible the attacks of deleterious agents.
10. Avoid wearing wet or insufficient clothing.
11. Wear a flannel shirt, or at least a woollen belt around the

belly. This has been found serviceable in checking the tendency to bowel complaints so common during the prevalence of the cholera.

12. Let personal cleanliness be scrupulously observed.

13. Avoid every cause tending to depress the moral energies.

14. Let the crowding of persons within houses or apartments, and sleeping in low, damp rooms, be avoided.

15. If the weather be moist or chilly, let small fires be kept up day and night, although out of season for them.

16. Finally, as every form and variety of indisposition during the prevalence of the epidemic has a tendency to merge itself in the prevailing disease, take immediate steps for relief, whatever may be the nature of the malady with which you are affected.

RECAPITULATION OF SYMPTOMS OF CHOLERA.

1. *Premonitory diarrhœa.*—This is painless and watery. It does not occur in all the cases, but in the majority. It may last an hour, or three or four days. Sometimes the patient dies in a few minutes, but such instances are rare.

2. *Rice-water Stage.*—The diarrhœa increases and vomiting comes on. The discharges become of the color of rice-water, and are thrown out with great force. The skin gradually becomes cold. The patient grows feeble. There are *cramps* in the limbs.

3. *Collapse.*—The patient loses his voice, or has what is called the "*choleraic voice.*" His breathing becomes difficult; his thirst is great. The urine is suppressed; the pulse disappears; the skin becomes cold, sunken, and of a *blue* color.—Death.

After all this the patient may suddenly recover.

The disease may run its course in a few minutes, a few hours, a few days, or in two or three weeks.

After death *the head and fingers and toes sometimes move.*

TREATMENT OF CHOLERA.

All that we can do for cholera is very simple:

1. Treat the premonitory diarrhœa by the cholera mixture. (See *Cholera Mixture.*)

Let the patient *rest.* Apply mustard plasters over the abdomen. Give hot foot-baths.

2. In the *rice-water* stage this prescription of Prof. Horner is recommended by Hartshorne:

Chloroform,
Laudanum,
Spirits of camphor,

Aromatic spirits of ammonia. Of each, one teaspoonful and a half.
Creosote, three drops,
Oil of cinnamon, eight drops,
Spirits of Gallic wine, two teaspoonfuls.

Dissolve a teaspoonful of this in a wine-glassful of ice-water, and give of that two teaspoonfuls *every five minutes*, followed each time by a lump of ice.

Give a little brandy at times, or other stimulants.

Rub the limbs with brandy or whiskey. Apply mustard-plaster to the pit of the stomach.

Persevere with all these remedies until the patient either dies or begins to recover.

The true way to cure cholera is to prevent it. The next best thing is to cure the premonitory diarrhœa.

Under our present sanitary regulations, and with our present knowledge of the causes of the disease, we can prevent it much better than formerly.

It is not probable that in future the epidemics of cholera will be as terrible as they have been in the past. Although we cannot cure it *much better than formerly*, *we have learned to prevent and control it by sanitary measures.*

CHOLERA INFANTUM, OR SUMMER COMPLAINT.

This disease of the summer and early fall months is almost peculiar to the United States, consequently English and French writers give but a very partial and deficient description of this disease. It attacks almost exclusively children between the ages of four and twenty months.

Causes.—The causes are excessive heat. An unusually warm and *moist* season will especially favor the production of this disease; impure air; insufficient or improper food; insufficient clothing; and lastly, the irritation of teething.

Description.—The manner of seizure is not always the same. It may commence as a simple diarrhœa, with but few symptoms of derangement of the stomach; or violent vomiting and purging may suddenly occur. The discharges from the bowels are very variable. They may be thin and watery, but are often mucous and mush-like. The features are anxious and expressive of suffering, sometimes pinched and contracted from the first. The skin is drier than natural, and the extremities cooler. In severe cases they may be cold and blue. The abdomen is usually warmer than natural. The general feverish symptoms increase towards evening.

Preventive Treatment.—In a work like this, this division of the subject is of the first and highest importance. It is in the power of almost every mother to prevent this ferocious disease. If the child's constitution is originally faulty and feeble, no solicitude however anxious—no care however prudent and skilful—may suffice to ward off an attack, but it is the *preventive plan alone which affords a shadow of hope.*

The gums should be frequently examined, and freely lanced, they giving the first symptoms of irritation. But the most important measure, without which all others may prove ineffectual, is early removal to a healthy locality. A child predisposed to bowel diseases, if resident of a city, should be sent into the country as early as June. The selection of a proper place is of no slight importance. The land should be elevated, the air pure and dry. The vicinities of large fresh rivers, the head of tide-waters where salt and fresh water mingle, and marshy districts, should be avoided. The sleeping-room should be large and airy; the bed a hair mattress or folded blanket; cold bath or cold spongings should be used every morning. The child should be taken into the open air every pleasant day; not for a few minutes only, but for hours. The dress should be loose and suitable to the temperature; a flannel roller should be kept constantly applied to the abdomen. The mother's milk is the child's best food, if the parent is healthy. It is her duty to attend carefully to her own diet, avoiding indigestible substances, crude and raw vegetables, &c.

TREATMENT OF CHOLERA INFANTUM.

This is a very severe and fatal disease, and requires great care in its management. If possible, skilled medical advice should always be obtained.

The general course of treatment is as follows:

1. Internally should be given a prescription containing aromatic syrup of rhubarb, bicarbonate of soda and prepared chalk, and a very little paregoric. (See *Astringents.*) The dose must, of course, be regulated by the age and constitution of the child.

2. Injections of starch and laudanum into the bowels.

3. If the stomach rejects food, place a little *chalk* on the tongue A little of the *oxalate of cerium* will also check vomiting oftentimes.

Pepsin in doses of 3 or 5 grains is also excellent for this purpose.

Subnitrate of bismuth may be used also, either alone or with the *pepsin*. Recently, Dr. Caro has warmly recommended the bromide of potassium for cholera infantum.

Sometimes, when the bowels are exceedingly loose and intractable, it may be necessary to inject *acetate of lead* (two grains to one ounce of starch) into the bowels.

To quench the thirst, place *bits of ice* on the tongue.

4. *To sustain the strength.*—The food should be lime-water and milk, farina, arrow-root, beef-tea. A very little brandy may be given with the food.

Raw beef scraped fine has been used as food in such cases with success.

But after all that we can do the disease is a hard one. It may be necessary to try all the well-known astringents.

The great thing is a *change of air.* Keep the child away from the city during the hot months of summer. *Cure the disease by preventing it.*

CLUB FOOT.

This is a deformity which is very familiar, and need not be described.

The *treatment* consists in cutting the tendons of the affected muscles with a "*tenotome,*" and in wearing some form of club-foot apparatus.

In the hands of a skilful surgeon great benefit results from persevering treatment. Parents make a great mistake when they suppose that their children will outgrow these or any other deformities.

CINNAMON.

Cinnamon is a medicine seldom given alone, but is much used on account of its vegetable, aromatic, and stimulant properties as an auxiliary to other remedies. Medicines for disorders not of an inflammatory nature are frequently given in cinnamon-water, which, to a certain extent, covers their disagreeable taste and flavor, and tends to prevent sickness at stomach. The best vehicle for the administration of prepared chalk, in cases of simple purging (*diarrhœa*), is cinnamon-water.

The oil of cinnamon, in doses of three or four drops, on sugar, is sometimes given to relieve spasms of the stomach and flatulent colic.

CITRIC ACID

Citric acid is obtained from the juice of lemons and oranges. It is principally used in forming effervescing draughts, and is the best remedy for sea-scurvy when fresh vegetables and lime-juice cannot be procured. A pleasant lemonade is made by dissolving thirty grains or more of citric acid in a pint of water, which is to be sweetened with sugar, and flavored with a drop or two of the essential oil of lemons. (See *Effervescing Draughts.*)

CITRINE OINTMENT.

Citrine ointment, which is made with lard and the nitrate of mercury, is used in chronic ophthalmia, specks, and ulceration of the front of the eye. When reduced in strength by an equal quantity of olive oil or lard, it is a very efficacious remedy for old sores, scald-head, and various diseases of the skin. Citrine ointment, when properly prepared, is of a golden yellow color.

COLCHICUM AUTUMNALE, OR MEADOW SAFFRON.

There is no better remedy in gout, rheumatism, and some other inflammatory diseases, than the root and seeds of this plant. When given in *moderate* doses it soothes the pain, and lowers the pulse without acting as an evacuant; but is an active purgative in *large* doses. It is a mistake to suppose that this remedy does no good unless it purges. The best manner of administering it is in doses suited to the urgency of the case, so as to produce its sedative or soothing effects without bringing on much purging or nausea. In very severe cases, it is proper to draw blood before using colchicum; but in general this is not necessary. It should always, however, be preceded by a purgative of calomel and jalap or colocynth.

The dose of the powered root, in acute cases, is five or six grains every four hours, or oftener, until slight purging is produced; the doses are then to be gradually diminished. The dose of the tincture of the seeds is twenty drops in a little water, to be repeated every four hours, or at longer or shorter intervals, according to its effects.

COD-LIVER OIL.

This is one of the most popular remedies of modern times. It is used as largely as calomel was thirty years ago. Cod-liver oil is obtained from the livers of the common cod. There are three varieties of the oil—*pale, light brown, and dark brown.*

Cod-liver oil has been used for scrofula, rickets, &c., in Scotland for a long time. In the latter part of the last century it was used at Cologne for chronic rheumatism. It was introduced into England from Germany by Dr. Bennett, and at first, like all good things, encountered opposition.

This remedy is used chiefly for consumption. It has the power of producing fat. Its effects vary with different individuals. To some it is so very nauseous that they take it with great difficulty. Others become readily accustomed to it. In what is called *rachitis*, or softening of the bones in children, it is very efficacious. It is used in *scrofulous enlargements, in some diseases of the skin, general nervous debility*, but especially in *consumption.* It increases the weight, diminishes the cough and expectoration, and night sweating, and in every way improves the *nutrition.* It is not believed to have any specific effect on consumption, but benefits those afflicted with that disease by *improving their nutrition.* Although it does not usually *cure* the patient, yet it retards the progress of the disease.

Doses.—Cod-liver oil is best given in the *froth of beer*, in *wine*, or in *whiskey*, in doses of from ½ to 2 tablespoonfuls, two or three times a day. It may be injected into the bowels, when necessary. The best time to take it is about two or three hours after meals.

COLD IN THE HEAD.

Although a disorder of no great consequence in itself, yet when neglected the inflammation attending it frequently extends to the mucous membrane of the windpipe and air-passages of the lungs, and brings on severe cough (see *Bronchitis*); or it may even terminate in pleurisy or inflammation of the substance of the lungs.

To infants, severe cold in the head is very distressing; the nostrils being completely obstructed, the child, after sucking a few mouthfuls, is obliged to quit the breast, and returning to it again and again, becomes at length quite exhausted, and perhaps falls into convulsions. Catarrh is a common attendant of measles, and frequently accompanies scarlet fever and small-pox.

TREATMENT OF A COMMON COLD.

Nothing is easier than to cure a common cold, provided *we take it in time.* Few things are harder than to cure a common cold that has *been long neglected.*

The *first hour* after a cold is taken it may readily be cured by anything *that restores the warmth and equalizes the circulation.*

When you even suspect that you may have taken cold, stand for *fifteen minutes with your back against* a hot stove-pipe, or *sit with your back* against the fire, in the stove, fire-place, or furnace.

Our colds enter through the back of the neck and spine more than through the breast, as is commonly supposed. We must drive out our colds by the same door through which they enter. Wet feet are a very common cause of cold, therefore it is well to bathe them in hot water with mustard, at the same time drinking anything that is hot. It is not of so much consequence what we drink as that we should drink it promptly, and in sufficient quantities to *open the pores of the skin that have been closed by the chill.* Alcoholic liquors, tea, coffee, herb teas of the various kinds, "composition" powders, and cold water, &c., all are good.

My own remedy for *a common cold* is my *cold powder* (see *Cold Powder*). I find it amply sufficient. If used in time, it almost always breaks the force of a cold, and sets it on the way toward recovery. It opens the pores of the skin in a gentle but most effective manner, promotes sleep, and, when not given in too large doses, leaves no unpleasant effects behind. It is a very simple remedy. It is not unpleasant to the taste. It requires no complicated apparatus, no profuse sweating, no forcing down of disagreeable drugs, no packing in flannel, and no scalding with hot water; and, more than all, does not make us *liable to take a new cold the next day.* The following morning after we have taken it we are safe to rise at our usual time and go about our business. (For dose, &c., see *Cold Powder.*)

Next to the cold powder I rank the well-known Dover's powder. It is, however, more disagreeable—is, indeed, to many exceedingly nauseous—and is no more effective, and, when given in large doses, is more apt to leave disagreeable effects.

Formerly Dover's powder was my great reliance.

COLD POWDER.

This is a name that I have given to a powder that I have for some time been accustomed to use in *colds and catarrhs.*

I obtained the suggestion originally from a friend and patient. I regard it as a *specific* for a *common cold*, provided it is given in time. The formula for making it is as follows:

Camphor, two parts,
Powdered opium, one part,
Carbonate of ammonia, two parts.

Dissolve the camphor in ether to the thickness of cream, then add the opium and ammonia. I regard this cold powder as much superior to the ordinary Dover's powder, for these reasons:

1. *It is more efficacious.*—It more surely breaks up a cold.

2. *It is more agreeable to the taste.*—The *ipecac* of the Dover's powder is exceedingly nauseous. In this preparation there is no ipecac, and the bitter taste of the opium is disguised by the *æther and ammonia.*

The preparation should be kept in a *bottle tightly corked.* It should usually be given at night, before retiring. The effect of it is to *open the pores of the skin* and to *produce sleep.* Unless an over-dose is given, no bad effects are experienced.

Dose, from *three to six grains* in a little water. It should be kept on hand at all times, and should be taken as soon as possible after we become chilled through, or even *suspect* that we have taken cold. The dose may be repeated the following night.

COLIC.

Common colic commences suddenly with griping pain, and a sense of twisting about the navel and lower part of the belly; and sometimes the whole belly is affected. The pain is not constant, but comes on in paroxysms. The bowels are constipated. There may be slight nausea, and even vomiting. A frequent, though not a constant symptom, is a rumbling noise in the bowels, arising from wind, which sometimes accumulates and distends the belly until it feels quite tense. The disorder is then called *Flatulent Colic.* In other cases, the belly is drawn inwards towards the spine, and the abdominal muscles are sometimes seized with strong spasms, and are drawn into hard knots which feel like balls in the belly. There is no fever; but, on the contrary, the skin is cool, the pulse generally weaker than natural, and the face bedewed with perspiration. When this affection continues longer than usual, the pulse becomes very feeble, the skin is covered with cold sweat, and the patient sometimes becomes so weak that he occasionally faints. Common colic is, however, almost invariably relieved in the course of a few hours.

This form of colic may proceed from sudden or long exposure to cold, wet feet, hardened or accumulated fæces lodged in the bowels, eating food difficult of digestion, cold drink swallowed too quickly, violent mental emotions, metallic poisons, rupture, and various other causes. It is distinguished from inflammation of the bowels by the absence of fever, and by the pain being relieved on pressure, which always increases it when inflammation is present. It must, however, be remembered that colic occasionally terminates in inflammation; there is then pain when the belly is pressed upon, heat of skin, thirst, and quick pulse.

TREATMENT OF COLIC.

The course of treatment in colic is—

1. *To empty the stomach,* if it should contain any irritating substances. This may be done by giving 15 or 20 grains of ipecac, or

a tablespoonful of mustard or common salt, in a cupful of tepid water. Simply tickling the throat with the finger will cause many to vomit, and will much assist those in vomiting who have already taken an emetic.

2. *To relieve pain and spasm.*—In order to quiet the horrible griping pains and correct the spasms, place a mustard plaster over the abdomen, or use hot fomentations on the abdomen with flannels wrung out in hot water. Give internally chloroform, one-fourth or one-half a teaspoonful, or opium (one-grain pills), or laudanum in the usual doses, until relief is obtained. Sometimes the patient can bear a large quantity of opiates in this affection.

Colocynth in very small doses has been given with pleasant results.

The cholera mixture I have often used with success in colic.

The prescription varies, but the ingredients are these:

Tincture of rhubarb,
Tincture of capsicum,
Tincture of ginger,
Tincture of opium, equal parts.

Dose, from 20 to 60 drops in water every half hour until the pain is relieved.

Exceedingly small doses of *colocynth* sometimes afford immediate relief in colic.

TREATMENT OF BILIOUS COLIC.

Bilious colic, during the attack, is to be treated in the same way as the ordinary colic. In the intervals measures should be used to prevent the recurrence of the attacks. The patient often needs *tonics*—air, exercise, sunlight, bathing, quinine, strychnine, phosphorus, arsenic, &c.

Bilious colic seems to run in families. When it is thus hereditary it is sometimes almost if not quite impossible to drive it from the system. Patients often outgrow it, or the disease takes some other form.

COLIC FROM LEAD, OR PAINTERS' COLIC.

This form of colic arises from the action of lead on the body, and occurs principally among house-painters, miners, plumbers, color-grinders, glaziers, gilders, those who are employed in melting lead, and among manufacturers of white lead and other preparations of that metal. It is also caused by drinking wine, cider, spirits, or water containing litharge, or the carbonate or acetate of lead in solution. Lead colic was first traced to its source about a hundred and thirty years ago, in Germany, where it was ascer tained that a custom had long existed of sweetening wines with litharge; and indeed this pernicious method of adulterating wine is far from being extinct. It is well known, for example, that the sweet wines of Italy are frequently adulterated with sugar of lead.

This disease seldom commences suddenly. During three or four days, or even longer, before the patient is prevented from attending to his work, he experiences a slight degree of numbness in his hands and feet, a dull, uneasy sensation in his bowels, loss of appetite, and sometimes slight purging during a day or two. At length sickness at stomach, headache, acute pain in the limbs, costiveness, and griping pain, with retraction of the belly, come on. These symptoms increase in violence as the disease advances; the bowels remain obstinately constipated; the pain in the belly and limbs becomes very severe, and extends to the back, loins, and hips; and, as in common colic, is not constant, but recurs in frequent paroxysms, which are accompanied in many cases with painful retraction of the testicles. The patient lies on his belly, or presses his hands against it; he tosses about in bed, and is exceedingly restless; and his suffering is so much increased in the night, that he is almost if not entirely deprived of sleep. Vomiting of acrid mucus or bile is not an unusual symptom, particularly when the fits of pain reach their height; but there are no symptoms of fever. The pulse continues natural, unless in bad cases, when it ultimately becomes quick and weak. The countenance throughout the disease appears sallow, and expressive of acute suffering. It does not often happen that the first attack of painters' colic is either accompanied or followed by palsy of the limbs; but in subsequent attacks the hands and arms, and sometimes the feet and legs, are paralyzed; and the right arm is more frequently affected in this manner than the left. The palsy affects the motion of the limbs only, and not the sense of feeling; and in many cases the paralyzed parts become greatly emaciated. But although this is both a tedious and a painful disease, yet it rarely proves fatal. It lasts generally from eight to ten days, but sometimes much longer, and is very apt to return, from re-exposure to its specific cause. The distinctions already noticed between common colic and inflammation of the bowels are also applicable to colic from lead.

TREATMENT OF LEAD COLIC.

Iodide of potassium is the remedy now given for colic which results from poisoning by lead. It combines with the lead, and forms *iodide of lead*, which is eliminated from the system. It may be given in doses of 5 or 10 grains in gum-arabic water.

Alum is used for the same purpose, but it is not so good as *iodide of potassium.*

Opium may be given to relieve the pain. In lead colic, opium seems to loosen the bowels.

Electrization is a most excellent remedy for poisoning by lead, and for the paralysis that is caused by it It is of course best adapted for the chronic condition. (See *Electricity* and *General Electrization.*)

COLIC IN INFANTS.

Infantile colic sometimes comes on in consequence of the retention of the dark matter called *meconium*, which collects in the bowels during a month or two previous to the birth of the infant. It also arises from too early feeding, improper food, and from the state of the mother's or nurse's milk, which may be deranged in consequence of bad health, an improper manner of living, or from certain moral causes.

An infant affected with colic is very restless, screams frequently, and appears in great distress. The lower extremities are drawn up upon the belly, the bowels are constipated, there is generally puking, and the belly is either more or less distended.

Treatment.—Although colic is sometimes caused by *meconium* being retained and becoming acrid and irritating to the bowel, yet this seldom happens when the mother is able to suckle the infant; but when a nurse is employed for that purpose, it is by no means an uncommon occurrence. This is owing to the quality of the milk, which, when first secreted, is sufficiently laxative to carry off the *meconium.* It is, however, very improper to interfere with the bowels, unless we are certain that it is really necessary to do so; and yet there is nothing more common than to find nurses forcing castor oil down the throats of infants within half an hour or an hour after they are born; indeed, this is frequently the first thing they are allowed to taste. The consequence is, that griping and purging are very often brought on; then a little paregoric elixir is given to soothe the bowels. This of course produces costiveness, to relieve which the nurse deems another dose of castor oil, or perhaps a little calomel necessary; and thus the poor infants are tormented in consequence of the absurd meddling of nurses, many of whom think that they are not doing their duty unless they are frequently employed in dosing infants with medicine and feeding them with thick gruel, arrow-root, and other substances which at that early age their stomachs cannot possibly digest; flatulency necessarily follows; then come the symptoms already mentioned, indicative of colic. The treatment to be adopted in such cases is very simple. The following injection is to be given as soon as possible:

Warm water, a wine-glassful,
Peppermint-water, two teaspoonfuls,
Castor oil, a teaspoonful,
Tincture of assafœtida, from ten to twenty drops. Mix.

This injection usually gives immediate relief; but if it fail in doing so, a small teaspoonful of *Hollands* gin with a little sugar and warm water, or from eight to twelve drops of the *tincture of assafœtida*, or the same quantity of *sweet spirits of nitre* in a small quantity of water, should be given. The warm bath, and rubbing the belly with the following liniment, are to be resorted to if necessary:

Camphor, a drachm, to be dissolved in
Olive oil, an ounce and a half,
Laudanum, a drachm. Mix.

This treatment rarely fails in relieving the little patient, who soon falls fast asleep. The following powder may be given some hours afterwards in sugar and water, or the bowels may be opened by means of a little manna dissolved in warm milk:

Calcined magnesia, six or eight grains,
Rhubarb, two grains,
Anise-seed, in powder, two grains. Mix.

COLLODION.

Collodion is a *solution of gun-cotton in æther and alcohol.*

It was introduced by Dr. J. O. Maynard, when a medical student. It is used to *protect wounds*, and for burns and raw surfaces. It forms a coating over the surface, and protects it from the air and other injurious influences. It is therefore of service for ulcers, carbuncles, in erysipelas, and in various diseases of the skin.

It is an excellent remedy for domestic use. It should be applied to the raw surface by means of a camel's-hair brush. When it dries a coating is left over the surface.

COLOCYNTH, OR BITTER APPLE.

This plant is a native of various parts of Europe and Africa. The dried fruit, which is the only part of it used in medicine, is imported from the Levant. Colocynth is seldom used alone, on account of its violent purgative action; the preparation of it in common use is the *Compound Extract of Colocynth*, which is composed of the spirituous extract of colocynth, aloes, scammony, cardamom seeds, and castile soap. This compound acts chiefly on the large intestines, and is one of the best purgatives we possess. It is very generally employed to keep the bowels regular, and enters into the composition of nearly all the purgative pills used for that purpose. The dose is one, two, or three pills, containing each five grains.

CONSTIPATION.

Constipation is a disease that every one in this country is familiar with. Very many errors are abroad in regard to it. It is supposed to be the result of mechanical obstruction of the bowels, and that therefore it should be treated by purgatives entirely, and by eating coarse food.

The truth is this: constipation is a symptom of very many and diverse morbid conditions of the body. In our times it is usually one of the symptoms of *nervous derangement.* It is a symptom of nervous dyspepsia. *When the food is properly digested in the stomach and intestines, and when the nervous system is in a proper condition, the bowels will usually be regular, whatever our diet may be.*

Constipation is exceedingly frequent. There is scarcely a family in the land that is not annoyed by it. This bad condition is brought on by these, among other causes:

1. Over-work and over-worry of the brain and nervous system.

2. Hereditary descent.

3. Bad diet—too much pork and sausages; too little fruit and fresh beef.

4. Neglect of the bowels. Every one should go to the water-closet at a regular time, once a day at least, whether they feel disposed to do so or not. This is an imperative duty.

The best time of the day for most persons is shortly after breakfast.

5. Neglect of physical exercise.

Farmers' wives and daughters are often sufferers from constipation, because they eat the same food—pork, ham, sausages, cabbages, etc.—as those laboring actively on the farm, and yet remain all the time indoors.

Any cause that injures the system at large may produce constipation of the bowels.

TREATMENT OF CONSTIPATION.

1. *Treat the cause of the constipation.*—Cure the nervous dys

pepsia. Strengthen the constitution by the rules already given. Treat the *dyspepsia* as directed under that disease. (See *Dyspepsia.*) If nervous exhaustion is the cause, treat that by all forms of external and internal tonics—air, sunlight, exercise, water, strychnine, phosphorus, quinine, iron.

If disease of the liver is the cause, treat that by the principles laid down under that head.

2. *Stop the evil habits that bring on constipation.*—Rest the brain. If possible, cease to worry. Take plenty of sleep. Take a change of air. Take occasional and short vacations, for one or two days at a time. Avoid tight lacing. Use less tobacco, less brandy, less tea, and less coffee, provided you have been accustomed to use any of these substances in large quantities.

3. *Regulate the diet.*—Study the rules given under Dyspepsia. Have a *variety* of food—*fresh meat, vegetables, bread, and fruit* Remember these golden rules—

1. Food which is best enjoyed is best digested.
2. Food which is best digested is best for the bowels.

Do not attempt to live on bran-bread and fruit exclusively.

If you like Graham bread and fruit, eat them in conjunction with fresh meats, fish, and other palatable varieties of food.

It is a great error to suppose that constipation is to be cured by mechanically forcing down the fæces by bran-bread, johnny cakes, and fruit.—For weak stomachs—and constipated patients often have weak stomachs—Graham bread, fruit, and Indian bread are usually more difficult of digestion than common white bread and biscuit, and therefore should be avoided.

Salt pork, sausages, ham, heavy bread of any kind, soggy pies, and cakes produce constipation by first inducing dyspepsia. As a rule, avoid eating very late at night, unless you are exceedingly hungry just before retiring.

It is hard for an invalid to sleep on a very empty stomach. The *best* kinds of food to eat just before retiring are oysters—raw or stewed—crackers, white bread and butter, and ripe mellow fruit; the worst kinds are soggy pies and cakes, nuts, candies, raisins, hard apples, and vegetables.

4. *Cultivate the habit of visiting the water-closet regularly each day at a certain hour.*—It is sometimes difficult to do this, especially when visiting among strangers and travelling, but yet it is a duty that we should never neglect. The habit will soon become a second nature. The best time in the day for visiting the water-closet is just after breakfast, or at least before entering on the active duties of the day.

Persons vary in their habits in this respect. Some maintain their health with two passages daily, others appear to be equally well with one passage every other day.

5. *Exercise the bowels in variety of ways.*—Riding on horseback, climbing hills and mountains, the Swedish movements, walking, playing active games, gymnastics, all forms of muscular exercise, and especially those which employ the muscles of the trunk, are to be recommended. We should select those methods of exercise which we love best, and as soon as we get tired of one method try another.

Kneading the bowels with the hands—the so-called Halstead method—is sometimes of decided service. This method, like "*rubbing*," "*lifting*," etc., is simply a modification of the movement cure.

6. *Use of medicines.*—Cathartics are terribly abused. Many patients purge all their strength away. It is quite rarely that patients should take large doses of cathartics for constipation.

If the preceding measures that I have recommended are not successful, it is best to obtain good medical advice. As I have said, it is well to take powerful cathartics only very rarely, if at all. If medicine is to be taken to act directly on the bowels, some gentle laxative is preferable.

The common dinner pill is a very good combination.

The following prescription contains four excellent articles for both indigestion and constipation:

Podophyllin,
Rhubarb,
Nux vomica,
Carbonate of soda—equal parts.

Make pills of *one grain each*, and take one at night before retiring.

It may be necessary to reduce the quantity of *podophyllin* for those who are very sensitive to this drug.

The podophyllin acts on the liver; the rhubarb acts on the bowels; the nux vomica gives tone to the stomach; and the carbonate of soda corrects the acidity.

But after all it is better that the bowels should be somewhat constipated than that they should be continually irritated by drugs.

Injections of cold water into the bowels in the morning have a tonic effect on the mucous membrane of the rectum, and help to bring away the fæcal matter. I think that they may be used without injury for months. But they do not cure the indigestion. They do not remove the *cause* of the constipation.

Hard cider is a good remedy for constipation. It does not agree with all patients. It is apt to cause headache. It may be taken at bed-time, or on rising.

Seidlitz powders and the mineral waters are sometimes permanently useful for constipated patients. It is unfortunate, however, to be compelled to use any such substance habitually.

General Electrization is the remedy that I have found more useful in constipation than any other form of treatment. It should be used skilfully, cautiously, and perseveringly (see *General Electrization*). Its results in constipation are often immediate, and frequently permanent. It calms the nervous system, improves sleep, sharpens the appetite, and strengthens the digestion, thus relieving the morbid condition of which constipation is a symptom.

Besides all this, general electrization acts mechanically on the bowels, in the same manner as horseback riding and the Swedish movements.

It may be said that it is too much work to go through all these processes and labors; that it is much easier to gain temporary relief by taking blue pills, calomel, rhubarb and senna, indefinitely, if necessary. I would remind those who feel thus that indigestion and constipation produce piles, headache, diseases of the genital organs in male and female, nervous exhaustion, and oftentimes seem to lead to diseases of the brain and spinal cord. Is it not worth while to prevent these serious conditions? Will it not be sufficient reward to save ourselves the pain, the distress, the depression, the exhaustion that are sure to result from chronic indigestion and constipation unless they are relieved?

There are cases of constipation which are of a markedly hereditary character, and which will not permanently yield to any method of treatment. Patients who are thus afflicted can, however, save themselves many sorrows by obeying the great laws of health, and by giving special attention to the management of their digestive organs, according to the principles I have indicated.

(For more extended remarks on constipation, see *Dyspepsia* and *Nervous Diseases*.)

CONVULSIONS, OR FITS.

The symptoms of convulsions or fits, especially in children, are very familiar.

Before the fit comes on the child is often fretful, restless, and perhaps grinds its teeth in its sleep.

The special symptoms of the attack are:

1. Twitching of the muscles of the face.
2. The body becomes rigid, and then is thrown into jerks.
3. The limbs are rapidly flexed and extended.

4. The head and neck are thrown backward.
5. The eyes roll, and have an unnatural appearance.

Sometimes a number of attacks rapidly succeed each other.

CAUSES OF CONVULSIONS.

Convulsions in children may be caused by worms, by constipation, by teething, by fear, by indigestion, by disease of the brain, by sudden drying up of eruptions on the head, and by very many of the acute and chronic diseases of childhood.

TREATMENT OF CONVULSIONS.

1. Ascertain the cause of the convulsions, and treat that. If the gums are swollen, lance them. If the bowels are constipated, open them by an injection of *warm water, soap, and molasses.*

2. Apply cloths wet in cold water to the head, and especially to *the back of the neck.*

Nearly all forms of convulsions in children and in adults may be cut short sooner by applying cloths wet in cold water, or, better still, *ice to the back of the neck*, than by making the same applications to the top and front of the head, because the back part of the brain and upper portion of the spine are frequently congested during the attacks.

Chapman's ice-bags are very useful in such cases. (See *Ice-bags.*) As a substitute for the rubber ice-bags we may wrap the ice in a piece of oiled silk, or even a common towel. The ice or wet cloths should not be kept too long on the child, else they may work injury.

3. *Put the child in a warm bath* if the cold applications fail.

4. Apply mustard plasters to the stomach and legs; cup the back of the neck in desperate cases.

During the intervals of attacks, use all means to improve the general condition of the child.

Besides infantile convulsions, there are convulsions of *epilepsy*, of *hysteria*, of *childbirth*, and of *St. Vitus's dance.*

It should be remembered that convulsions may be evidences of serious disease of the brain, for which, of course, medical advice should be obtained if possible.

COPAIVA.

The *balsam of copaiva* is obtained by making incisions in the trunk of a lofty tree (*Copaifera officinalis*) which grows in South America and the West Indies. This balsam is not easily obtained in a pure state, being frequently adulterated with castor oil, and sometimes with rape oil; and there is no doubt that it is manufactured both in London and Paris to a very considerable extent. Copaiva was formerly employed as a remedy in disorders of the mucous membranes of the bowels and lungs; but *gonorrhœa*, and its sequence *gleet*, are now the only diseases in which it is used. The dose is from twenty to thirty drops or more, either taken on a little sugar or beat up with the yolk of an egg, or a little mucilage of gum arabic. The French use it enclosed in thin gelatinous capsules, by which means the disagreeable taste, and also the odor, to a certain extent, are concealed. (See *Gonorrhœa.*)

COPPER.

The only preparation of this metal in general use is the *sulphate of copper*, or *blue vitriol*, which is principally used externally to destroy "proud flesh," and is sometimes applied to the inner surfaces of the eyelids in chronic ophthalmia. Sulphate of copper is considerably used in the treatment of inflammations of the eye. It is also employed in weak solutions in the treatment of nasal catarrh. The solutions are injected with the posterior nasal syringe. It may be given in a dose of from ten to fifteen grains in three ounces of water, as an emetic in cases of poisoning, when tartar emetic and sulphate of zinc (white vitriol) have not had the effect of producing vomiting.

CORNS.

This term is given to the circumscribed, horny-looking excrescences of the toes and feet, which are caused by wearing improperly made boots or shoes. Corns are for the most part situated on the outside of the little toes, on the soles of the feet, and between the toes; and in some individuals all the prominent parts of the toes to which undue pressure has been long applied are invaded by them.

Treatment.—The first thing to be done is to remove the cause of corns, by wearing boots and shoes neither too large nor too small, and constructed as nearly as possible to the shape of the foot, so as to obviate unequal pressure. If shoes be worn, they should come sufficiently high on the instep to prevent undue pressure on the toes, and the material of which they are made ought to be soft and pliable; without these precautions other means will be of no avail, at least as far as regards effecting a radical cure, whereas by attention to them alone, corns frequently disappear entirely, or at all events their progress is arrested.

There are several ways by which corns may be eradicated, provided, as we have just mentioned, that properly constructed boots and shoes are worn. The following are the best methods with which we are acquainted:

The *first method* consists in removing the pressure from the corn, by applying over the toe on which it is situated a piece of doe-skin spread with adhesive plaster, with a hole cut in the centre large enough for the corn to rest in; the pressure of the shoe is thus removed from it and thrown on the surrounding parts. If this be kept constantly applied, and the prominent part of the corn cut occasionally with a sharp knife or razor, it will gradually disappear.

The *second method* is that of removing the corn entirely without breaking it; this, however, can only be practised by an expert person accustomed to the operation, who, with an instrument for the purpose, scrapes round the circumference of the corn, carefully and gradually detaching it, until at length he reaches the extreme point of the root, and in this manner it is completely extracted, without giving the least pain. The cavity is then filled with a little simple ointment, and the part covered with adhesive plaster.

The *third method*, which is very frequently practised, consists in destroying the corn by means of *lunar caustic*. The hard part of the corn is first to be cut away as much as possible without causing pain or making it bleed; the foot is then to be kept in warm water during a quarter of an hour or twenty minutes, and after drying it properly the lunar caustic is to be applied over the surface of the corn without using it too freely. The part is then to be covered with adhesive plaster, and at the expiration of ten days or a fortnight the dead scarf-skin generally comes away with the corn attached to it; if not, the caustic is to be re-applied. A few hours' rest are necessary after the caustic has been employed; hence the most convenient time to apply it is immediately before going to bed.

Sir Benjamin Brodie is of opinion that concentrated *nitric acid* or strong *aquafortis* is the best thing for destroying the soft corns which are usually seated between the toes. It is to be applied by means of a probe with a bit of lint attached to the end, and employed so as to penetrate into the substance of the corn without injuring the parts beneath.

The corns which form on the soles of the feet are exceedingly troublesome and not easily got rid of. Relief to a certain extent may be given by taking off the pressure from the corn and throwing it on the surrounding parts, by means of the diachylon plaster, employed in the manner recommended for bunyons, or by wearing a felt sole in the shoe, with a hole in it corresponding to the corn.

CORPULENCE (OBESITY).

Corpulence is rightly called a disease. In some cases it becomes exceedingly annoying, and may even shorten life.

Even as I am writing, the tidings comes from Philadelphia that a lady has just died near that city from corpulence. For two months before her death she had been unable to move about. Her weight was enormous.

A Mr. Banting, of England, has written a little pamphlet, in which he gives his own experience in the reduction of fat. His principle was to abstain from sugar and starchy substances. The results were quite successful. It should be remarked, that some persons cannot prevent the formation of fat by merely abstaining from food, or by drinking vinegar or other acids.

Banting had previously tried all the ordinary methods. Some others who have tried his method have thereby seriously injured themselves. *What does well for one, may not for another.*

COSMETICS.

Cosmetics are preparations that are used to improve the color and appearance of the skin. Some of them are quite harmless; others are injurious. The well-known *cucumber cream* is, I suppose, a harmless preparation. It is made, according to Piesse—a good authority on this subject—of *benzoinated lard*, *spermaceti* and *spirit of cucumber.* It is rubbed over the face at bed-time. *Glycerine* is one of the best cosmetics, and it enters into many of the recent preparations.

Rouges, or *paints for the face*, and *powders* are now quite popular. Actresses and singers make a very free use of *rouge* and red *paints* to improve the color of the face. The use of *paint* among these classes is almost universal.

According to Piesse, *bloom of roses* is made of *strong liquid ammonia*, *carmine*, rose-water, *esprit de rose triple.* Piesse states that this preparation is much used in France and Germany.

Theatre rouge is made of *Brazil-wood*, *lake*, and the *safflower.* *White paint* for actresses is made of *oxide of bismuth.*

I must warn my readers against the patented preparations that are now so freely used. Some of them contain lead in poisonous quantities, and cases of lead poisoning have come under the observation of the profession, that are caused by the free use of these preparations. A few years ago a young lady came into the clinique of one of our medical colleges complaining of symptoms which had evidently resulted from working in lead. She said that she had been making *bloom of youth.* She was quite pale, and the professor aptly remarked *that* "*in making the bloom of youth she had lost her own.*"

Piesse states also that the blue of the vein is imitated by chalk tinted with *Prussian blue.*

Very much of the apparent softness and delicacy and color of the faces of our city ladies especially is manufactured every day to order by paints and rouges.

It would be very appropriate for me to say just here that the best cosmetic is the *sunlight*, and the prettiest color a healthy brown; but I know very well that few would believe me, and still fewer would act upon the suggestion.

Powders for the face are made of *starch* and *orris root*, and are perfumed by cloves, bergamot, lavender, lemon, and otto of roses. The "puff" with which they are applied is made of swan's down.—*Piesse.*

COW-ITCH, OR COWHAGE.

This is a creeping plant, which grows in great abundance in the East and West Indies. It bears pods covered with brownish-colored hairs, which, when allowed to touch the skin, occasion the most violent itching. An electuary, made at the time it is to be used, by mixing these hairs with molasses, jelly, or honey, is an excellent remedy for expelling worms. The dose for a child is one or two teaspoonfuls (according to the age), which should be taken before breakfast, and followed by an active purge of castor oil after the second or third dose. This remedy, no doubt, acts mechanically on the worms, and yet when given in large doses does not produce griping or purging. We have used cow-itch in the West Indies in some hundreds of cases, and have never known any bad effect result from it, nor have we ever found it to fail in expelling the long round worms. It produces no effect on the tape-worm, and very little on the small worm of the lower bowel. (See article *Worms.*)

CREAM OF TARTAR.

Cream of tartar acts as an excellent diuretic in dropsy of the belly, not depending on diseased liver or other visceral obstructions when taken to the extent of an ounce, dissolved in a pint and a half or two pints of water, in the course of the day. An excellent purgative in common use is cream of tartar and jalap, in the following proportions:

Cream of tartar, thirty grains,
Jalap, fifteen grains. Mix.

The solution of cream of tartar known by the name of *imperial drink* is a useful beverage in feverish affections.

The best laxative for those who are troubled with piles is composed of cream of tartar and sulphur, of each a drachm.

It is a cooling drink in fevers.

CREAM.

Sweet cream is a good medicine for consumptives. Some consumptive patients cannot or will not take cod-liver oil, on account of the taste, but are willing to take cream in large doses. It is by no means as useful for consumptives as cod-liver oil, but it is certainly a remedy of value. It may be combined with whiskey. Some patients can take, with benefit, half a tumbler of cream and whiskey with their meals. It is an interesting and suggestive fact that consumptive patients oftentimes dislike fat meat, and fat of all kinds.

Such patients frequently enjoy the taste of cream, and are benefited by using it freely.

COLD CREAM—CAMPHOR ICE.

Cold cream, so much used in the toilet, may be made of *almond oil*, *rose-water*, *otto of roses*, *white wax*, and *spermaceti*. With the addition of camphor, this becomes the so-called *camphor ice*.

CREOSOTE.

This was discovered in 1832. It is obtained by distillation of vegetable and animal substances. It is useful in *vomiting*, in *diarrhœa*, in *sea-sickness*, in *hemorrhages*, in toothache (applied in the cavity), in inflammation of *mucous membranes*, in burns, in chilblains, gangrenes, in *skin diseases*, and *for ulcers*.

In its action it much resembles carbolic acid, but is inferior to it. On account of its disagreeable odor, it is much less used than it would be if its odor were more agreeable. Of late years carbolic acid seems to be taking its place.

In *diarrhœa* I have found remarkable results from creosote. Perhaps carbolic acid might have served my purpose just as well.

Doses—One or two drops in water, well shaken. Some persons will bear very large doses.

CROTON OIL.

The plant from which it is produced grows in Ceylon, the Malabar coast, China, and the neighboring countries. This oil is a powerful purgative in the dose of one or two drops, either made into a pill, with crumbs of bread, or taken in a little castor oil; and two or three drops rubbed on the tongue act with equal certainty; hence its value in apoplexy attended with difficulty in swallowing, mania, tetanus accompanied with locked jaw, and in other diseases where remedies in more bulky doses could not be easily administered. When apoplexy is threatened, the prompt and powerfully revulsive action of this remedy may be the means of warding off the impending danger; and it has been often known to give relief in cases of obstinate costiveness and colic when other means had failed. It has been used with advantage to assist the action of other remedies in expelling tape-worm.

Croton oil rubbed in upon the skin produces an eruption of small pustules, and when used in this manner has been found in some cases preferable to the tartar emetic ointment as a counter-irritant.

Croton oil, two drachms,
Almond oil, an ounce. Mix.

CROUP.

The disease termed croup, although it occurs occasionally in the full-grown person, may be considered to belong to children. It consists in a peculiar inflammation of the windpipe, which gives rise to the production of a whitish membrane, somewhat similar to the lining of an egg-shell. Upon this inflammation, upon the presence of the white membrane in the air-passages, and upon the spasmodic action which both are apt to produce, the symptoms of croup and its dangerous consequences mainly depend.

Croup occurs commonly in young children between the ages of two and six years. It is rarely met with in infants at the breast.

Symptoms.—Croup usually commences with all the appearance of common cough, and is not easily detected, even by the medical man, in its earliest stage. The child coughs, and has more or less fever, with hot and cold fits, flushed face, watery red eyes, and restlessness at night. The cough at this time is occasionally hard and hollow, and the child shows signs of uneasiness about the throat by frequently carrying the hand to this part, and complaining of pain. The voice may also be hoarse; and when these symptoms exist, no time should be lost in the application of appropriate remedies, for although they may be nothing more than common cough with irritation of the throat, yet they may be the first signs of an attack of croup, and it is infinitely better to have expended a little care, anxiety and medicine for nothing, than to allow a disease of the most fatal kind to gain ground and establish itself, from the want of proper attention. The symptoms just enumerated may continue for a few days or weeks without much change; but sooner or later the character of the cough suddenly alters, and assumes what is called the croupy sound. This changes usually takes place in the night, and is so peculiar that when a person has once heard the croupy cough he can never mistake it again. It is a sharp dry, ringing cough, which is followed by a hissing inspiration, and is compared to the crowing of a cock or the barking of a young puppy. The fits of coughing are most frequent during the night, and soon produce a most unfavorable effect on the state of the little patient; the face is flushed, and often bathed in perspiration; the eyes watery; the skin burning hot; the pulse frequent and hard; the voice is hoarse; and the upper part of the windpipe is often tender to the touch. This is the first dangerous change in the character of the complaint, and when it has once taken place, the symptoms commonly proceed from bad to worse. During the early stage the fits of coughing are not very frequent, and during their intervals the child may obtain a little rest; but they soon return with renewed severity. The croupy sound, hissing breathing, and suffocation, are now more evidently marked (*confirmed stage*); the face is bloated; the pulse extremely quick, and the skin hot; each fit of coughing seems to threaten death by suffocating the child; and when the fit has passed over he lies in a state of extreme anxiety and restlessness, with the head thrown back and all the muscles of respiration in full action, showing that nature is making violent but vain efforts to convey air in sufficient quantities to the interior of the chest. The fits of coughing are now sometimes followed by vomiting, and very often by the discharge from the windpipe of viscid phlegm or shreds of the white membrane which is formed inside; in some cases regular moulds of the air passages, resembling pieces of macaroni, are spit up. This gives a temporary relief, but the fits of suffocative coughing soon return, and reduce the patient to an extreme degree of weakness (*collapsed stage*). The difficulty of breathing is now permanent, and the little sufferer does not seem to obtain a moment's relief, but lies gasping for breath, with a sunken countenance and cold skin. The pulse is now very quick, small and, weak; the face bathed in a cold sweat, and pale, with lividity of the lips; the cough is less frequent, and is evidently failing with the strength of the child; the voice is almost inaudible; the patient becomes restless, often makes convulsive efforts as if to free his throat from some obstruction, and either perishes in convulsions, or falls into a state of lethargy, which gradually settles down into death.

There are two kinds of croup—true and false. True croup comes on gradually, and is less likely to excite alarm than false croup, which comes on suddenly. True croup is attended with fever and false membrane in the throat; false croup is not attended with fever or false membrane in the throat. True croup is almost always fatal in the course of four or five days; false croup always recovers, but is liable to come on again. (See *False Croup.*)

TREATMENT OF TRUE CROUP.

If no physician can be obtained, begin the treatment early, for although almost all cases of true croup die, yet there is every possibility of a mistake, and what we suppose to be true croup may be only an attack of false croup. Even if the case prove to be one of true croup, and ultimately it will be a consolation to have tried to save the life of the patient, and to have somewhat relieved his sufferings.

1. Give ipecac in doses just large enough to cause mild vomiting.

2. Place a warm poultice around the neck. During all the treatment sustain the patient by beef-tea and stimulants cautiously used.

3. Fill the room with the vapor of boiling water. A large kettle filled with boiling water may be kept on the stove until the room is filled with hot steam. The room should be kept at a very warm temperature.

In desperate cases physicians sometimes open the larynx.

It is proper to remark here that true croup is not so common an affection as is commonly supposed. *The great majority of cases of the so-called croup are simply cases of spasm of the glottis, or false croup.* "Croupy children" are those who are liable to these attacks of *false croup.* I repeat again that these attacks cause unnecessary alarm.

FALSE CROUP, OR SPASM OF THE GLOTTIS.

This is a spasmodic closing of the glottis, with shrill breathing. It comes on quickly, and lasts but a little time. It is most frequent *during the period of teething.*

It sometimes greatly alarms the parents of the child, who fear that the symptoms betoken real croup.

TREATMENT OF FALSE CROUP.

1. Slap or strike the back and limbs.
2. Apply cold to the head.
3. Put the feet in hot mustard water. This treatment is almost always successful.

Some children are subject to these attacks very frequently. During the intervals they should be treated by tonics, such as iron, phosphorus, strychnine, sunlight, &c.

This subject of false croup is so important that I quote in full from Tobold:

"During an attack we place the child in an upright position, sprinkle water in the face, admit pure fresh air, strike with the hand on the back, rub the extremities with flannel, or put sinapisms on the breast and calves of the legs, and apply quieting lavements, especially with infused chamomile or valerian.

"Sometimes the excitation of choking, through irritation of the soft palate and pharynx by means of the finger, relieves the spasm. Inhalations of ether or chloroform are also highly spoken of by many authors. But they must be used on children with great caution.

"In regard to the prophylaxis (prevention), which is not less important than the therapeutics, we have first of all to prevent the recurrence of the attacks by improving the diet and avoiding all injurious causes. All physical excitation, terror, anger, sudden waking out of sleep, irritation of the air-passages through faulty swallowing in drinking hastily, also punishment that tends to frighten children, should be zealously avoided. The sucking child may be allowed to remain at the mother's breast, unless other diseased states demand a change.

"If the child has been weaned shortly before the attack, restore it again to the mother's breast, or provide a good wet nurse. When this is not convenient, at least provide unadulterated milk from one and the same good cow, or ass's milk, either pure or adulterated with one-third water, according to the age of the child.

"In the next place, provide for good and healthy air, and for a residence in a sunny mountain region that is protected from the north-east winds, or on the sea-coast.

"Taking cold must be sedulously avoided by appropriate warm clothing. The diet of older children should be stimulating and nourishing, but as easily digestible as possible.

"Weakly, cachectic children we treat by means of tonics, administering bark, or the syrup of the iodide of iron, from 2 to 5 grains, three times a day.

"In our special therapeutics, we have chiefly to direct our attention to the existing basis of disease. Disordered digestion, intestinal catarrh, the irritation of worms, diarrhœa, demand corresponding remedies."

CUBEBS.

The plant from which this species of pepper is obtained is a native of Java, the Mauritius, the island of Ceylon, and other eastern countries. Cubebs were first used medicinally in Europe in 1816, and are now in very general use in the treatment of gonorrhœa, which yields readily to this pepper when taken in the dose of a drachm (about a dessert-spoonful) thrice a day, in a small quantity of water, or in wine and water. (See *Gonorrhœa.*) Cubebs have also been known to give considerable relief in chronic catarrh of the bladder, in doses of ten or twelve grains three times daily.

DANDELION.

This is a very common and well-known plant; the only preparation directed in the pharmacopœia is the *extract of dandelion*, which is not supposed to possess any active medicinal property. It is sometimes given, on account of the bitter principle which it contains, as a tonic in indigestion, and from its diuretic virtue is occasionally administered in dropsical affections, along with more active remedies. This plant is said to have been of great service in jaundice, and in chronic inflammation of the liver, and of the lining membrane of the stomach; but its virtues appear to be much overrated by some medical men. The dose of the extract of dandelion is half a drachm, four times a day, in peppermint or cinnamon water.

DEADLY NIGHTSHADE, OR BELLADONNA.

This plant grows in hedges, thickets, and shady places, and is frequently met with amongst old ruins. In the month of September it bears sweetish-tasted berries, of a purple color, which are powerfully narcotic, and from their resemblance to cherries, children are sometimes tempted to eat them, and death is not unfrequently the consequence. The symptoms arising from eating the berries are delirium, accompanied with violent laughter and various gestures, as if the individual were grasping at imaginary objects; the eyes are red, and appear as if they protruded from their orbits, and the pupils are dilated and immovable. These symptoms are soon followed, when the case terminates fatally, by loss of voice, difficulty in swallowing, and convulsions. This poison has the effect of paralyzing the stomach, so that emetics are rarely found to act; it is advisable, however, in the first instance, to give three grains of *tartar emetic*, or twenty-five to thirty grains of *sulphate of zinc* (*white vitriol*), or six grains of *sulphate of copper* (*blue vitriol*), in a little water; but the only way which can be trusted to of emptying the stomach is by means of the stomach-pump. The best antidotes are strong coffee, and the effusion of cold water on the head and body, and *morphine*.

We are indebted to the German physicians for our knowledge of the medicinal virtues of this plant, which, though of great value in the hands of experienced medical men, is nevertheless of too dangerous a nature to admit of being used with safety as a popular remedy.

Belladonna was first used in the form of infusion as a fomentation, to soothe the pain of cancerous and other foul sores, and has since been employed internally in a similar manner to hemlock, henbane, and other narcotic remedies, as a palliative in cancer. The extract of belladonna rubbed over the eyebrows and eyelids has the peculiar property of dilating the pupils of the eyes; hence it is generally used for that purpose before the operation for cataract is performed. In cases of blindness arising from opacity of the centre of the lens, a little of the infusion of the leaves of belladonna dropped into the eyes three or four times a day, by dilating the pupils, allows the sight to be restored for a time; and it has been stated that this practice may be continued for years. Professor Beer, the celebrated oculist of Vienna, recommends half a drachm of the extract, with an equal proportion of mercurial ointment, to be rubbed in upon the temple every night at bed-time in cases where there is deep-seated pain of the eye-ball; and the extract alone, applied in the form of plaster, often gives relief in cases of tic-douloureux and rheumatic pains. The belladonna plaster of the pharmacopœia, applied under the loins, is often of great service in allaying the pain attending difficult menstruation.

An ointment composed of a drachm of the extract of belladonna mixed with seven drachms of lard is an excellent remedy in piles, and when rubbed on the perinæum gives relief in chordee. Belladonna has been used of late years as a remedy in hooping-cough. Professor A. T. Thompson says: "I have ordered the extract in doses of one-eighth of a grain to a child eight years of age, and gradually increased the dose to a quarter of a grain. Its power over the cough is extraordinary. It produces a state of the skin closely resembling scarlatina, accompanied with fever, suffused eye, dimness of sight, and frequently, though not always, headache. Whilst these symptoms continue, the cough remains absent, but it returns as soon as they disappear. By keeping the habit for a sufficient time under the influence of the remedy, the period of the disease has always been greatly shortened." Hahnemann, Hufeland, and other German physicians, recommend belladonna to be given in the following manner as a preventive of scarlet fever:

Extract of belladonna, three grains,

Cinnamon water, an ounce. Mix. Three drops of this solution are to be given twice a day to a child a year old, adding one drop for every year, until twelve be taken for a dose.

This defensive preparation has, however, been known to fail in several cases in which it has been tried where scarlatina was raging as an epidemic. The smallness of the dose, however, renders it perfectly harmless.

In administering belladonna, the precaution must be attended to of commencing with small doses; half a grain of the extract, or a grain of the powder of the dried leaves, gradually increased to three or four grains, or until slight giddiness, dimness of sight, and a sensation of dryness and heat of the mouth and throat are felt. (See *Atropine.*)

DEAFNESS. (See *Ear*, *Diseases of.*)

DELIRIUM TREMENS.

This disorder arises from excess in drinking spirituous liquors, or from the abuse of opium; rarely from other causes. It comes on generally after a debauch, or in drunkards, in consequence of giving up their accustomed stimulus too suddenly. In some cases delirium is the first symptom observed; but in general there are certain premonitory signs, indicative of its approach. The patient is restless, peevish, and cannot sleep well; his manner becomes hurried and abrupt, and he appears low-spirited. After remaining some time, perhaps two or three days or a week, in this state, his ideas become confused, he bustles about as if he had more business to do than he could manage, he is exceedingly restless, and there is an appearance of wildness in his countenance. The characteristic symptoms of the disease then begin to declare themselves; the hands, and sometimes the whole body, are in a constant state of tremor; the tongue is also tremulous, and there is a twitching motion of the tendons at the wrist. If the patient sleep, it is only for a short time; he awakes suddenly, alarmed by some frightful dream. At length the mind becomes affected; he fancies that there is some mischief plotting against him, or that his affairs are going wrong, and is constantly talking about them. When the delirium is fully established he cannot sleep, and attempts frequently to get out of bed. If he escape from his apartment there is no difficulty in leading him back to bed, if he be spoken to quietly; but if thwarted he becomes exceedingly suspicious, accuses those near him of having some mischievous design against him, and struggles to get away. The hallucinations attending this disease are always of a desponding character; the patient fancies that he is attacked by robbers, and struggles as if he were defending himself; or he supposes that a swarm of bees are hovering around him, and he moves his arms as if he were driving them away.

It is of the utmost importance that delirium tremens should not be mistaken for inflammation of the brain, inasmuch as the treatment required for the latter would produce the worst effects in the former disease, which is to be distinguished from other affections of the brain by the absence of pain, the trembling of the hands and tongue, the starting of the tendons at the wrists, the peculiar character of the delirium, and the knowledge of the previous habits of the patient. On the other hand, a patient with inflammation of the brain has a strong, full pulse, hot skin, flushed face, red eyes, dry and red tongue; he suffers from a distressing intolerance of light and sound; and the delirium is generally furious.

The length of time required by delirium tremens to run its course is very uncertain, but it generally terminates within a week, and is not a dangerous disease when judiciously treated. (See *Stimulants and Narcotics* for remarks on *Chronic Alcoholism.*)

TREATMENT OF DELIRIUM TREMENS.

1. Give the patient one grain of opium every three hours. If this fails, double the dose.

2. Give nourishing and easily digested food.

3. Try chloroform, in doses of one or two teaspoonfuls, or bromide of potassium, in doses of 40 grains. It is the opinion of many that delirium tremens is best treated by giving no medicine whatever—by simply "letting the patient rip."

Delirium tremens seems to be caused both by sudden withdrawal of stimulants and by continuing to use them to excess.

During the attack the patient should be kept where he can do no harm. The bromide of potassium may be given during the intervals of the attacks, in doses of 10 or 15 grains.

On the treatment of this disease Aitken thus remarks:

"Opium may be administered with safety and advantage only in protracted cases, provided the quantity given in twenty-four hours is never allowed to exceed the full dose which would be considered safe for a healthy person of the age and sex of the patient. Where it appears to be indicated in protracted cases, it ought to be pushed as rapidly as possible for two or three doses, while its effects are carefully watched. Its use must be discontinued for at least a good many hours, as soon as a full maximum amount of from half a drachm to two drachms of the tincture in all has been reached, or even sooner if the pupils have become at all considerably contracted during its use. This remedy should always be given in the fluid forms, otherwise it is apt to accumulate in the bowels, owing to the weakened state of the digestion; and a laxative, or even a purgative, should be alternated with opium, followed by a bitter tonic, which always operates favorably in lingering cases of nervous and dyspeptic exhaustion. Narcotics are thus only safe in delirium tremens when they are given with the object of aiding and seconding the natural cure of the disease, employed in moderate doses, and given only at the later stages. The heroic use of them, as heretofore too often advocated, even by the most eminent physicians, is now recognized as a treatment which merely substituted narcotic poisoning for alcoholism or delirium tremens."

DIABETES.

This disease usually commences slowly, and the general health often suffers materially before the nature of the disorder is discovered. The first symptoms experienced are indigestion, general debility, constipation of the bowels, thirst, and irregular, capricious, and sometimes voracious appetite. At length the patient accidentally notices that his urine is considerably augmented in quantity, and, from the time that this observation has been made, he finds that the quantity discharged gradually increases. As the disease proceeds, the symptoms already mentioned become more severe; the skin feels harsh and dry; there is a sensation of heat and weight at the stomach; alternate chills and flushes of heat are experienced, and the patient is very low-spirited. All the symptoms go on steadily increasing in severity; the urgent thirst and frequent desire to empty the bladder become very distressing, particularly during the night; there is a dull aching sensation across the loins, slight giddiness, and occasional headache; cough, and shortness of breathing, and entire loss of sexual desire. As the disease advances towards a fatal termination, the gums become red, swollen, and bleed from the slightest pressure, the taste is depraved, the tongue is foul, with red edges; the strength is much diminished, and the body emaciated; the appetite, which was previously voracious, gives way; the legs become dropsical, and the pulse is quick and weak.

The urine is of a pale straw color, sometimes insipid, but in the great majority of cases it has a sweetish taste and faint smell, somewhat resembling that of violets, and contains a considerable quantity of sugar. The presence of sugar is ascertained by chemical tests. There is a form of diabetes where there is no sugar in the urine. This form is less serious in its character. The quantity of urine voided varies from eight to twenty pints daily, and there are well-authenticated cases on record in which the average discharge was from forty to fifty pints a day. The weight of the urine when the disease is confirmed invariably exceeds that of the liquids drunk, and is in some cases greater than both the food and drink consumed, even when the hunger and thirst are extreme. The quantity of sugar contained in the urine is much greater in some cases than in others, and it varies in the urine of the same individual at different times; an ounce of sugar has been extracted, in several cases, from each pound of urine.

The nature of diabetes is so little understood, that medical men have not yet been able to decide with regard to the part of the body in which it is seated. Some suppose that the kidneys are the primary seat of the disease, others that it depends on the state of the stomach or of the skin; and it has been imputed to a diseased state of the blood. Various causes have been assigned for this disease, such as exposure to cold when the body is in a state of perspiration, abuse of spirituous liquors, long-continued bodily and mental exertions, excess in venery, grief, and, in a word, whatever depresses the vital powers; but if these or other exhausting causes could of themselves bring on this disorder, it would certainly be of more frequent occurrence; there can be no doubt, however, that they act as exciting causes, when there is a disposition to the disease in the system.

Diabetes runs its course in some cases in a month or two, and continues in others during several years. It is sometimes complicated with pulmonary consumption or chronic bronchitis, and is so frequently fatal that many medical men, though they admit that it may be much relieved, or even suspended for a time, are nevertheless of opinion that a radical cure cannot be effected.

There are *two* kinds of diabetes. *In one there is sugar in the urine; in the other there is not.* Diabetes with sugar in the urine is the more serious form. Physicians detect the presence of sugar in the urine by chemical processes.

The prospects of a patient afflicted with diabetes are not good. Recovery is rare. They may, however, be much benefited by dieting and by medicine, and may live many years.

TREATMENT OF DIABETES.

There is no specific for this disease. Everything has been tried, with failure. The patient may take any of the ordinary tonics with advantage. It is found by experience to be best to abstain from sugar and from starch, which is converted into sugar in the process of digestion. Bicarbonate of soda, in doses of a drachm three or four times a day, appears to do good.

Dr. Champlin recommends bran bread for diabetic patients. He speaks from personal experience of its efficacy. The formula for making these bran cakes is as follows:

"Take a quantity of wheat bran. Boil it in two successive waters for a quarter of an hour, each time straining it through a sieve; wash it well with cold water on the sieve, until the water runs off perfectly clear. Squeeze the washed bran in a cloth as dry as possible, then spread it thinly on a dish, and place it in a slow oven. When it is perfectly dry and crisp it is fit for grinding into fine powder.

"The bran thus prepared is ground in the mill for the purpose, and must be sifted through a wire sieve of such fineness as to require the use of a brush to pass it through, and what remains on the sieve must be reground till it is sufficiently soft and fine.

"To prepare a cake, take of this bran powder three or four ounces, three new-laid eggs, one and a half or two ounces of butter, and about half a pint of milk. Mix the eggs with a little of the milk and warm the butter with the remainder of the milk; stir the whole well together, adding a little nutmeg and ginger, or any other spice that may be agreeable. Bake in small tins (pattipans, which must be well buttered), in a rather quick oven, for about half an hour. The cakes when baked should be a little thicker than a captain's biscuit.

"These cakes may be eaten with meat or cheese for breakfast, dinner, and supper, and require a free allowance of butter; and the cakes are more pleasant if placed in the oven a few minutes before being placed on the table.

"When economy is an object, when a change is required, or if the stomach cannot bear butter, the cakes may be prepared as follows: Take of the prepared bran four ounces, three eggs, about twelve ounces of milk, with a little spice and salt; to be mixed and put into a basin (previously well buttered). Bake it for about an hour; the loaf may then be cut into convenient slices and toasted when wanted; or, after slicing, it may be re-baked and kept in the form of rusks.

"Nothing has yet been discovered of equal utility to these bran cakes, combining, as they do, moderate cost with freedom from starch, and sufficient pleasantness as an article of food."

However surely an exclusive animal diet may lessen or entirely remove the sugar in the urine of a diabetic patient, it is certain that it cannot long be tolerated. Under its use the appetite fails, and a loathing of all food soon happens. The necessity of a mixed diet for man has been shown; and it is as necessary for him when suffering from diabetes as in a state of health. In this disease the nervous system is undoubtedly implicated, and a rigid adherence to animal food alone, were it practicable, would soon be followed by an aggravation of the nervous trouble. There is, from the very beginning, and throughout the course of the disorder, a strong tendency to devitalization, and this, too, must be guarded against. Fortunately, the sugar in the urine may be kept down, and at the same time the general strength of the system maintained, by a properly adjusted diet of mixed food. Along, then, with the carnivorous dietary, whose importance is not to be undervalued, certain vegetables may be permitted, not only with impunity, but with advantage, and these are cabbage, cauliflowers, onions, spinach, water-cress, sorrel, endive, lettuce, &c. Trousseau has found no ill consequences from eating acid fruits, as strawberries, gooseberries, cherries; and he has allowed apples, pears, and grapes. He even suffers his diabetic patients to eat a small quantity of bread, if they greatly crave it, for, as he remarks, there are many persons who are unable to make a meal without it. Such a regimen is more likely to keep the disease stationary, and secure the general comfort of the patient, by upholding his strength, than by confining him to one kind of diet, which his stomach soon revolts against, and which must result in innutrition, general debility, the development of intercurrent affections, and, sooner or later, death. Enforced daily exercise in the open air, when possible, just short of fatigue, is of as much importance in the treatment of diabetes as diet. Gymnastics should be practised. Trousseau says that he has repeatedly seen, during the hunting season, diabetic patients, abroad with their gun and dog, cease both to drink and urinate to excess, and regain their strength, and even their virile powers. A suit of flannel or buckskin should be worn next the skin. Warm alkaline baths should be frequently taken. *Diabetus insipidus, where there is no sugar in the urine, is far less serious in its character*, and may sometimes be successfully treated by ordinary tonics, or by small doses of *permanganate of potash.*

DIARRHŒA.

FLUX, LOOSENESS OF THE BOWELS, PURGING.

This is a common and well-known disorder, characterized by more frequent and thinner evacuations from the bowels than natural, accompanied or not with griping pains in the belly, and occurring generally without fever. Diarrhœa is frequently a prelude to dysentery, and both these disorders are caused by a morbid state of the mucous or lining membrane of the bowels: in the former there is simply irritation or relaxation of the mucous membrane; in the latter there is inflammation, attended with constant pain and fever.

Diarrhœa arises, in the majority of cases, from errors in diet, and may take place from eating too much, from unwholesome food, or from a peculiarity of the patient's constitution, which allows him to be acted on by certain articles of diet which would produce no unpleasant effect on other people. Other not unfrequent causes are checked perspiration from exposure to cold, sitting with wet feet, drinking cold water, cider, beer, or other cold beverages, and taking ices when the body is overheated at the time; suppression of the menstrual or other evacuations, and increased or depraved secretion of bile. In some constitutions this affection comes on from sudden fright, surprise, anger, or any other strong mental emotion; and is also common in fever and measles, and generally accompanies the last stage of pulmonary consumption. Diarrhœa is frequently induced in warm climates by *malaria*, and is in all countries occasionally epidemic, from causes of whose nature we know little or nothing.

Diarrhœa, from whatever cause it may proceed, is commonly announced by flatulency, slight distention and griping of the bowels and sickness at stomach. In some cases the belly is considerably swollen, hot, and painful. The patient feels relieved after each evacuation, which is voided without the slightest straining. The stools vary from six or eight to twenty or more in number in the course of twenty-four hours, and are at first copious, and appear as if a dose of salts had been taken, but afterwards scanty and watery, in some cases mixed with bile, and in others with mucus.

Treatment.—The first thing to be taken into consideration in directing the treatment of diarrhœa is the cause which has produced or may still keep it up.

When diarrhœa arises from over-eating, from irritating or unwholesome food, or from constipation of the bowels, it is then an effort of nature to expel the offending matter, and ought not therefore to be checked abruptly by astringent remedies, which, though of great service when judiciously used, are often given indiscriminately in all cases of this disorder, which they frequently aggravate, or bring on other diseases of a more serious character. In many cases the efforts of nature are sufficient to restore the bowels to a healthy state, and in general there is very little occasion for the interference of art. In most cases a mild dose of castor oil, or the following mixture, is all that is necessary :

Rhubarb in powder, fifteen grains,
Henry's magnesia, a scruple,
Cinnamon water, an ounce and a half,
Compound tincture of lavender, half a drachm. Mix.

In the *treatment of diarrhœa* observe these simple rules. They will answer for the great majority of cases.

1. *Do not check it too early.*—If treatment is commenced at the outset, some mild laxative may be useful, to remove the irritating substances in the bowels.

2. *Use mild astringents.*—The common *chalk mixture* is deservedly popular. For all ordinary diarrhœa I use *creasote*, in doses of from *two to six drops*, largely diluted in water. I have had excellent success with it. It may be given every two hours, and may be combined with paregoric, or laudanum, or morphine. The *cholera mixture* (see *Cholera Mixture*) is to be recommended.

Children are successfully treated by lime-water, by *pepsin*, and by *subnitrate of bismuth*. Laudanum and starch injections are useful in bad cases. Except in severe cases, an astringent mixture should not contain much opium.

The diet in diarrhœa should be very bland. Arrow-root and brandy may be taken for a day. Common flour paste is excellent. Cold drinks should not be used. *The cure will be hastened* *by staying in the house, keeping a horizontal position, and binding tightly over the abdomen a flannel bandage.*

TREATMENT OF CHRONIC DIARRHŒA.

This is a very obstinate and intractable disorder. *Subnitrate of bismuth* in doses of five grains has been used with success. It was found to be very successful during the late war, in the diarrhœa of the army and navy. All the astringents may be tried, one after the other. The common lead and opium pill is much used in chronic as in acute diarrhœa. *Ipecac*, in vomiting doses, once wrought a remarkable cure in my hands.

The diet must be carefully managed in both chronic and acute diarrhœa.

It is necessary to abstain from vegetables and raw fruits, and subsist for a time on bread, meat, rice, &c.

DIARRHŒA, OR LOOSENESS OF THE BOWELS IN INFANTS. (See *Management of Children.*)

DIPSOMANIA, OR METHOMANIA.

This is the insanity of hard drinkers. It is not so uncommon a disease as is supposed. Most of the gross intemperance of our day is the result of *disease of the brain.* Spirituous liquors in great excess and largely adulterated often injure the brain, and deprive the individual of his *self-control.* This is one of the worst effects of hard drinking. Opium has the same effect. Such persons can never be saved by the pledge. They violate all pledges. They plunge headlong to destruction. In spite of the tears of their families, in spite of warnings, in spite of the horrors of impending poverty, in spite of disease and threatening death, in spite of the most solemn promises to themselves and to their friends, they cannot resist the temptation to drink to excess. For all such persons we should be as charitable as we are for those who are raving mad. *They are not responsible beings.* The time has come when we must *revise* our treatment of drunkenness. When we administer pledges we do not give protection. (See *Insanity.*)

TREATMENT.

Dipsomaniacs and *opiomaniacs* should be treated like other *maniacs.* They should be restrained. They have no will, and we must supply will for them. It is frequently well to confine such patients in a good inebriate asylum.

DIPHTHERIA (PUTRID SORE THROAT).

The name diphtheria was first given in 1827. The *disease* has been known for centuries. In some sections of the country it is more frequent than in others. It may be either a very mild or a very severe disease.

The *symptoms* are, *sore throat, general exhaustion, swelling of the glands behind the jaw, difficulty of swallowing, fever, headache, and disturbance of digestion; bad breath, thick, yellowish deposit or exudation in the tonsils and in the throat; rapid pulse.*

Some very mild cases do not have *all* of these symptoms. In the milder cases there may be very little fever, and the exudation may be very slight indeed. In the worst cases there is a *high fever*, very great swelling of the glands, great difficulty of swallowing; sometimes exceedingly offensive breath; hemorrhage from the mouth, rectum, or stomach, and in the last stages stupor. Death may take place in two, three, or six days.

Sometimes albumen is found in the urine; sometimes a blistered or abraded surface on the body will be covered with a whitish membrane; sometimes *lung fever* occurs.

Diphtheria often leaves bad effects behind it, even when the patient recovers. It leaves paralysis; it leaves disorders of the eye or of the ear.

Diphtheria is a *constitutional* disease—a blood disease, and not merely a local inflammation of the throat. I knew a patient who died from mere exhaustion after the throat had entirely recovered. It is a *poison* in the system, and the affection of the throat is only *one* of the accompanying symptoms. It should be remembered that sore throat, and even whitish exudation in the throat, does not always mean diphtheria. Many persons who have suffered from some attack of sore throat, that perhaps may have been accompanied by some slight deposit in the tonsils, oftentimes erroneously suppose that they have recovered from an attack of diphtheria. Physicians used to make the same mistakes.

The mild form of this disease is not usually fatal; the malignant form is one of the most dangerous diseases that we have to contend with.

TREATMENT OF DIPHTHERIA.

There is no specific for diphtheria. Moreover, it is one of those diseases that demand the best-trained medical skill that can be obtained; and those are particularly unfortunate who are attacked with the grave form of this disease when far away from home.

1. The great thing in diphtheria is to *sustain the system*, as in typhus and typhoid fever. The disease is one of debility. Therefore we give *quinine*, *muriated tincture of iron* in the ordinary doses, with stimulants if necessary. *Sulphite of soda* is given by some, in doses of ten grains, on account of the power which it is supposed to have to destroy the poison in the blood.

Chlorate of potash internally, in large doses, and locally in the throat.

2. *Local treatment in the throat.*—This, after all, is a secondary matter, although it is of importance. *Ice in small pieces*, creasote, or carbolic acid, or glycerine, gargles of chlorate of potash, of alum, or of chlorinated soda—all may be tried. With all of these substances the solutions should be made just strong enough to *smart slightly*—but not stronger. Better have the solutions too weak than too strong. Outside the neck, flannels wrung in hot water afford relief.

Inhalations of the spray of lime-water and other substances, or even of pure water, are good. (See *Inhalations*.)

DISINFECTANTS. (See *Hygiene*.)

DOVER'S POWDER.

Dover's powder is composed of one grain of opium, one grain of ipecacuan, and eight grains of the sulphate of potash. This celebrated powder was discovered by Dr. Dover, a physician of considerable reputation in the reign of George II., and was long in general use before it received a place in the pharmacopœia. Opium alone, in inflammatory diseases, would do mischief; whereas, when given in this combination, in cases where sweating is indicated, it often produces the very best effects. The patient should remain in bed while under the influence of this remedy, and as soon as perspiration begins to break out he ought to drink freely of barley-water, toast and water flavored with lemon-peel, or any other mild beverage, not acidulated, in order to keep up the discharge from the skin.

Dover's powder is now much used to calm the nerves, to produce sleep, and especially to open the skin after catching cold. For the latter purpose it should be taken as early as possible, and just before retiring.

For reasons that I have elsewhere given, I much prefer my cold powder to the ordinary Dover powder. It is less nauseous to the taste, and, I think, more efficacious. The dose is ten grains, and five grains more may be given at the expiration of an hour if necessary.

DROPSY.

Various names are given to this disorder, according to the parts in which the fluid is deposited: if in the general cellular substance, it is called *anasarca;* in the belly, *ascites;* in the chest, *hydrothorax;* in the head, *hydrocephalus;* and in the testicle, *hydrocele.*

Dropsy is either active or passive. *Active or acute dropsy* may be general, in consequence of increased action of the heart, induced by various causes, such as exposure to a cold, moist atmosphere, particularly when the body is in a state of perspiration from active exercise or long exposure to heat, suppression of the menses or other customary evacuations, sudden disappearance or repression of eruptive diseases, abuse of spirituous liquors, etc.; or it may be local, arising from irritation or inflammation of the parts where the fluid is deposited; for example, dropsy of the belly or chest may take place in consequence of increased action in the vessels of the serous membrane which lines these cavities.

Passive Dropsy arises in general from causes which impede the circulation of blood in the veins, such as various tumors pressing on the great blood-vessels, ossification of the valves of the heart, etc. The blood being, from these or similar causes, retarded in its course, the vessels become distended, and at length relieve themselves by pouring out the watery part of the blood. This form of dropsy sometimes comes on from directly debilitating causes, such as repeated blood-letting, or excessive loss of blood from other causes; inordinate discharges of every description; poor or relaxing diet; drinking immoderate quantities of watery fluids; living in low, damp situations; long-continued chronic diseases, as pulmonary consumption, dysentery, etc., and various other debilitating causes. Dropsy, in fact, is generally a symptom or sequence of other disorders, and rarely a disease of itself, arising, in the great majority of cases, from organic disease of the heart, lungs, liver, kidneys, and other internal organs.

GENERAL DROPSY (*anasarca*)

Is either acute or passive, and consists in the effusion of *serum*, or the watery part of the blood, into the cellular substance situated beneath the skin.

Passive general dropsy may arise from any of the debilitating causes above mentioned, but occurs most frequently from disease of the heart or some internal organ. Under these circumstances the fluid is thrown out slowly; the face, or the feet and the ankles, are swollen at night; and the parts pit on pressure, which is a characteristic symptom of the affection. At the commencement of the disease the swelling disappears in the morning; but after some time becomes more permanent, and gradually ascends higher, until the whole body is affected. While the dropsy is gradually increasing, the face and eyelids become sallow, swollen, and bloated, the breathing oppressed, and the pulse frequent, weak, and sometimes intermitting. There is considerable thirst, the urine is scanty and high-colored, the appetite greatly diminished, the bowels are constipated, and towards the termination of the disease there is great debility, and the mental faculties are much impaired.

Acute general dropsy commonly arises from some cause capable of suddenly checking perspiration, or it comes on during convalescence from scarlet fever or measles. This form of dropsy is decidedly inflammatory, and may result from exposure to cold, wet, or any of the ordinary causes of inflammation. It is ushered in by shivering, full or hard pulse, headache, thirst, and heat of surface. These symptoms, in the course of twenty-four hours, are followed by dropsical swelling, which generally appears first in the face, and shortly afterwards extends to the trunk and extremities of the body. In most cases there are well-marked inflammatory symptoms accompanied with headache, a sensation of tightness about the chest, and difficulty of breathing; but sometimes there is very little general excitement, and the pulse may not rise above the natural standard. Dropsy attended with inflammatory symptoms, more or less acute, frequently follows scarlet fever, both in children and adults; and the one disease may supervene upon the other in the course of a few days or weeks. Acute general dropsy is usually associated with inflammation of some internal organ; but cases are occasionally met with in which no local disorder can be traced.

DROPSY OF THE BELLY. (*Ascites.*)

This is the most common of all kinds of dropsy, and may come on at any period of life. The causes which have been already enumerated as capable of developing general dropsy may also bring on this form of the disease, which, as in the former affection, may be either active or passive; but in the great majority of cases it comes on slowly, without inflammatory action, and is symptomatic of organic disorder of the abdominal viscera, more especially of the liver. Another not unfrequent cause is inflammation, either acute or chronic, of the *peritonæum*, or lining membrane of the belly.

The water accumulates first at the lower part of the belly, which gradually enlarges, and the swelling goes on increasing until the entire abdomen becomes very prominent, tense, and shining. The swelling may be observed to gravitate towards the side on which the patient leans; and if the left hand be placed on one side of the belly, and a smart tap be given to the opposite side with the right hand, the water may be felt fluctuating. There are in most cases considerable thirst, loss of appetite, and dry cough, and the urine is scanty and of a dark brown color. When the water has accumulated to a considerable extent, the breathing is oppressed, and the face and parts of the body not consecutively infiltrated become much emaciated. In some cases the feet and ankles are swollen before any change is observed in the size of the belly; but in general the lower extremities are not affected until the abdominal dropsy has existed some time.

Dropsy, as we have already mentioned, is almost invariably a symptom of organic disorder, and therefore, in order to direct the treatment on scientific principles, it is of the utmost importance that the organ affected should be known. In general there are well-marked symptoms of visceral obstruction before dropsy makes its appearance, and, after it is considerably developed, the general appearance of the patient allows a sufficiently accurate opinion to be formed with regard to the organ which has given rise to the affusion. When the belly is much enlarged and the lower extremities swollen, while the arms and upper parts of the body are emaciated, the face being at the same time thin, sharp, and of a sallow, dingy color, it may be inferred that the liver is diseased, or, at all events, that the cause of the dropsy is situated in the belly; on the other hand, when the face is bloated, the lips swollen, so that the mouth remains partially open, and the eyes appear as if protruding from their orbits, there is every reason to suppose that the obstruction is in the chest, and that, most probably, the heart is diseased; and this opinion will be strengthened if it be ascertained that the dropsical swelling commenced at the feet and ankles, and subsequently extended to the belly. The reverse of this takes place when dropsy arises from inflammation of the *peritonæum*, or from obstruction of the liver, or of any other abdominal organ; here the swelling of the lower extremities of the body is always a consecutive symptom.

There is another kind of dropsy of the belly, called Encysted Dropsy, in which the water is confined in a cyst, or membranous bag. In this case the swelling is at first unequal and confined to a particular part, and when the affection is further advanced the belly is never so uniformly distended as in the former variety, where the water is loose in the abdominal cavity. Encysted dropsy progresses slowly, is entirely local, and not attended with disorder of the general health.

DROPSY OF THE CHEST.

This affection frequently results from inflammation, either acute or chronic, of the *pleura*, or serous membrane which lines the cavity of the chest, and envelopes the organs contained in it; or it may take place from any of the causes which give rise to general dropsy, but chiefly from diseases of the heart and lungs. When the effusion is the consequence of inflammation of the pleura, the water is generally confined to one side of the chest, and is merely a symptom of pleurisy; but when it arises from organic disease of an internal organ, the water collects slowly in both sides of the chest, and constitutes, in connection with the original affection, a very formidable and dangerous disease.

When dropsy of the chest proceeds from disease of the heart, the first symptoms generally observed are, a swollen state of the eyelids in the morning, and of the feet and ankles at bed-time, accompanied with slight oppression of the chest and difficulty in breathing. The patient may be affected in this manner during a considerable length of time without suffering much inconvenience, until the water, which has been gradually accumulating, at last increases to such an extent that a train of very alarming symptoms is brought on. The face becomes much swollen and bloated; the lips assume a livid tint, approaching at times to a deep purple color; the breathing is greatly oppressed; the patient starts in his sleep, and cannot lie in bed without having his head and shoulders raised with additional pillows; and towards the termination of the disease, the sensation of suffocation is so distressing on lying down that he is compelled to sleep sitting in a chair. The difficulty of breathing is much increased by going up-stairs, or by any ordinary exercise; the pulse is generally irregular and intermitting; and the feeling of anxiety is at times very distressing, and strongly depicted on the countenance. To these symptoms are generally added palpitations of the heart and a troublesome dry cough.

When water collects in the chest in consequence of bronchitis or of inflammation of the lungs, the difficulty of breathing, and of lying in a horizontal position, is the same as in the former case; but the effusion is seldom to the same extent, and is not attended with palpitations of the heart and intermitting pulse. Although the above symptoms generally accompany water in the chest, yet they may arise from organic disorders of the heart and lungs, independent of dropsy; and there is no doubt that prior to the discovery of the stethoscope, diseases of these organs were frequently mistaken for this affection.

TREATMENT OF DROPSY.

The different varieties of dropsy are all to be treated on the same general principles.

1. Give jalap and cream of tartar by some such prescription as this:

Jalap, twenty grains,
Cream of tartar, six ounces.
Give one-third or one-half of this every day or two.

The object of this medicine is to act freely on the bowels and kidneys. *Sweet spirit of nitre* is much given, to act on the kidneys. In bad cases, where the bowels are very obstinate, *elaterium* may be given, in doses of one-eighth of a grain or one-quarter of a grain, every four or five hours.

When the patient is weak and feeble, tonics should be given—iron, quinine, strychnine, and nourishing food.

When in spite of all treatment the water remains, it may become necessary, in dropsy of the belly, to *tap* the patient. This operation is performed by the surgeon.

But, after all, the directions that I can give for the treatment of dropsy are at best very general and unsatisfactory. Dropsy is *not a disease;* it is a *symptom* of a disease. The true way to treat it is to treat the disease that causes it. What this disease may be can only be ascertained by the experienced physician. It is most apt to depend on some disease of one of these three organs—the *liver*, the *heart*, and the *kidneys*. It is a very common symptom in Bright's disease of the kidney. (See *Kidney*, *Diseases of.*)

ACUTE DROPSY OF THE BRAIN

Is a very frequent and fatal disease among children. It consists in an inflammation of the membranes which surround the brain or line its central cavities; the dropsy (or effusion of fluid into the cavities) being nothing more than an accidental occurrence towards the close of the disease, nearly in the same way as dropsy of the belly may follow disease of the liver, or dropsy of the chest may attend a disease of the heart.

Causes.—It is often difficult to assign any cause for this complaint, because it frequently attacks robust children in the midst of apparent health; but we know from experience that it has been produced by the following causes: blows upon the head, exposure of the head to a hot sun, the sudden removal of some eruption on the head, irritation of the brain, occasioned by teething or by derangement of the bowels, and, finally, the disturbance of the blood-circulation in the brain, which often takes place in the course of hooping-cough, measles, scarlet fever, or small-pox. But of all the exciting causes of this fatal complaint, none is more frequent than scrofula. In a great number of cases it depends on a true scrofulous inflammation of the brain or its membranes. This explains the insidious nature of the complaint, its prevalence in certain families, the hereditary tendency to it, and its fatal termination; for we have every reason to fear that one species of this malady is just as fatal amongst children, as pulmonary consumption is amongst grown-up people.

To understand the nature and cause of the *premonitory* symptoms we should state, that it has been shown that acute dropsy of the brain is often preceded, for months or years, by a slow *scrofulous* inflammation of the membranes of the brain. The existence, then, of this scrofulous inflammation of the brain, or in other words, the *premonitory stage* of acute dropsy in the head, is indicated by the following signs. The child loses its natural liveliness of temper, and becomes dull and morose; the sleep is disturbed, and the little patient often drowsy during the day; he complains every now and then of headache; the bowels are usually costive, and occasional vomiting, with accesses of fever and tenderness of the belly, are noticed; the gait of the child is sometimes very peculiar during this stage: he staggers when walking, stumbles without any cause, or may drag one foot after him; squinting and convulsive movements are sometimes observed, with a bending in of the thumbs, and curving of the toes towards the soles of the feet. These symptoms may last, as we have said, for several months or years; they are frequently mistaken for infantile remittent fever; but at length severe headache, with vomiting, constipation, and stupor, supervenes, and the slow disease becomes all at once converted into the acute malady.

Acute dropsy of the brain almost invariably proves fatal when it has passed the *first* stage without having been relieved; our great anxiety should therefore be to detect the disease in its most early stages, and not to confound it with other complaints of children, to which it may bear some resemblance. The symptoms of the *first* stage of acute dropsy of the brain should be *distinguished* from those of the typhus fever, from the commencement of eruptive disorders, and from the peculiar head symptoms which sometimes accompany exhaustion of the vital powers in young children.

TREATMENT OF ACUTE DROPSY OF THE BRAIN.

1. Give purgatives. Adapt the quality and quantity to the strength and age of the patient. Keep the bowels free, but do not exhaust the patient.
2. Apply blisters and cups to the back of the neck.
3. Apply cold to the head, but with great caution.
4. Give *iodide of potassium* internally, in doses suited to the age of the patient. This causes absorption of the fluid in the brain.
5. Give nourishing but easily digested food. Beef-tea, mutton-broth, and milk are to be recommended.

These measures are about all that we can do.

CHRONIC DROPSY OF THE BRAIN.

Chronic dropsy of the brain consists in the slow collection of a clear fluid in the cavities of the brain, generally accompanied by gradual enlargement of the head. This disease may either occur in the child before it is born, or may come on very soon after birth. In the first case, it is usually attended by such changes in the brain itself as render it impossible for the child to live; in the second case, the head enlarges slowly, or even retains its natural size, and some small hope remains of obtaining a cure; hence we shall confine ourselves to giving an account of this latter form.

The causes which excite chronic dropsy of the brain in children are very obscure. It is said to occur most frequently in the children of scrofulous parents, as a consequence of fright experienced during pregnancy; as the effect of depressing passions, drunkenness, &c., on the part of the mother; it may also be produced in the infant after birth by improper food, teething, spirituous liquors, affections of the bowels, or other complaints which reduce the strength.

Symptoms.—Chronic dropsy of the brain sometimes comes on in a very insidious manner, and often escapes our notice at an early stage. When the natural articulations of the head are open, and the skull much enlarged in size, with a sensation of fluctuation at the anterior part of the crown of the head, there can be no mistake about the nature of the disease; but when the skull retains its natural shape and size, or enlarges very slowly, and when the child's health is not much deranged, it is not an easy matter to discover the nature of the complaint, although it is of the utmost importance that we should be acquainted with its existence as soon as possible. The early symptoms, then, of chronic dropsy of the brain are: an unusual peevishness and perversity of temper, dulness, and an inclination to sleep; irregular appetite, with constipation of the bowels and scanty urine; if the child be able to walk about, it will often be observed that the legs are weak and small in proportion to the rest of the body, while the belly is large and tense. The senses of hearing and seeing are at first acute, but soon become dull, and are more or less injured; the child cannot articulate words distinctly; the tongue seems to be getting too large for the mouth, and the mental faculties are also weakened. These latter symptoms should always excite our attention to the state of the head in young children; the head should be carefully measured with a tape, and if it be found to have increased very sensibly in a short time, we may be almost certain that the child labors under chronic dropsy of the brain.

As the disease advances the symptoms become more clear. The mental and bodily powers are more or less injured; the memory is lost, and the power of speech much diminished; a copious saliva flows from the mouth; the child is unable to support himself on his legs, and the head begins to hang on one side; the pupils are dilated, the sight lost, and the eyes frequently affected with squinting; the bowels are still irregular, and the contents of the stomach are often vomited up.

In the *third stage* of the disease the head becomes so enlarged that the child is no longer able to support it; he lies in a state of stupidity, and does not notice what passes around him; the senses are almost completely destroyed; the power of moving is lost, the evacuations are passed without the patient's being conscious of them; in this state he lies for a considerable time, when he is cut off by convulsions, or sinks into profound insensibility, which soon terminates in death.

TREATMENT OF CHRONIC DROPSY OF THE BRAIN.

It is impossible to cure these cases. They may, however, linger many years. Usually they die in a few months or years.

The best we can do is to sustain the strength of the patient by tonics, good food, and leave the results with Providence.

I may say just here that the friends of patients usually make a serious mistake when they follow after unprincipled quacks in order to obtain relief from diseases that have been proved to be incurable by the experience of honorable and scientific men.

There are many excellent people who run after every charlatan they can hear of, and seem to prefer their advice to that of sensible and reliable physicians.

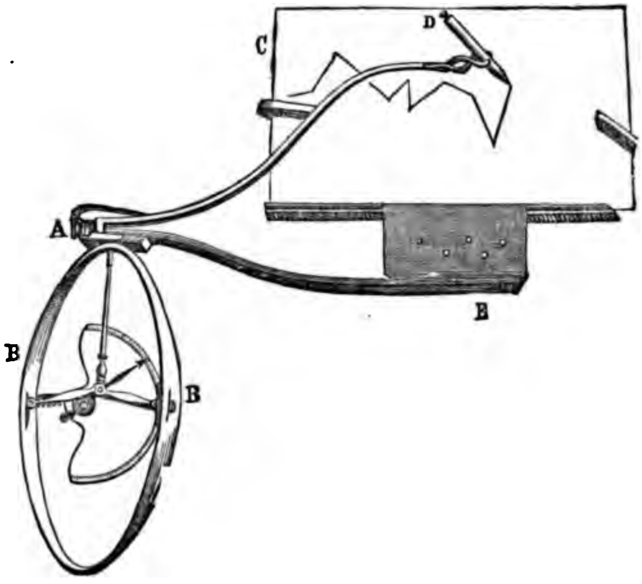
While it is true that happy guesses are sometimes made by these swindlers, it is also true that in the great majority of cases they are less successful than are educated physicians, and oftentimes they do incalculable harm.

DYNAMOMETER AND DYNAMOGRAPH.

This apparatus is used to test the strength of paralyzed arms. By means of this the physician can determine the condition of e limb, and the progress of the case under treatment.

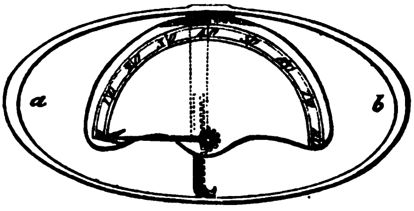
The clock-work attachment is similar to that connected with the phygmograph. (See *Sphygmograph.*)

FIGURE 4.—THE DYNAMOGRAPH.



THE DYNAMOGRAPH.

FIGURE 3.—THE DYNAMOMETER.



THE DYNAMOMETER.

The instrument is not yet very much used.

DYSENTERY.

In treating of dysentery, the division into acute and chronic may be adopted, though the disease presents many different forms and complications.

ACUTE DYSENTERY.

Acute dysentery is usually preceded by a disordered state of the stomach and bowels, as indicated by nausea, vomiting, loss of appetite, flatulence, and constipation, or the bowels may have been relaxed for some time previous. It commences with frequent evacuations, accompanied by severe griping pains, great desire to strain while at stool, and a burning sensation at the *rectum* and *anus;* there are frequent chills, followed by flushes of heat; the pulse is quick, or perhaps not much affected; the stools at first may be copious and feculent, and contain pieces of hardened fæces, but they soon become scanty, and consist chiefly of mucous matter tinged with blood; a dull, uneasy sensation is felt in the belly, which is relieved after each evacuation; the tongue is furred, and there is considerable thirst. These are the most prominent symptoms of the disease as it occurs in its mildest forms, but in its more severe states all the symptoms are aggravated; the calls to stool are very frequent and distressing, and sometimes accompanied with cramps in the thighs and legs; the abdominal pain is more constant, and increased on pressure with the hand, though often merely a feeling of heat is complained of, except when a motion is about to be passed; the tongue is thickly coated, and the appetite gone, while the thirst becomes urgent, the patient preferring cold water, each draught of which is invariably followed by severe griping; the urine is high-colored, passed in small quantities, and often with great pain and difficulty; the skin is hot and dry, or perhaps only feels hot over the abdomen, the extremities being cold, though sometimes there may be free perspiration. With the advance of the disease the strength gives way, there is despondency, rapid emaciation ensues, and the straining is occasionally so violent that a portion of the gut descends beyond the *anus*, greatly augmenting the suffering. As a fatal termination approaches, the abdomen becomes swelled and tender to the touch; the tongue dry and glazed, or covered with a dry brown fur; the motions are passed in bed, the patient being unable to get out to reach the close-stool; the extremities of the body become cold, and delirium, hiccup, and cold clammy perspirations, are the forerunners of death.

The character of the evacuations varies much, both as regards appearance and quantity; sometimes they are copious and watery, containing shreds of matter like the washings of beef, or they are scanty, and of a dark-brown or greenish color, with streaks of blood; at other times, after violent straining, only a small quantity of slimy mucus is passed. The odor in all cases is peculiar, but sometimes it is extremely offensive, particularly in the last stage; the motions may then be composed of pure blood, or a dark fluid, mixed with feculent matter, and occasionally small whitish masses resembling fat are discharged.

The disease in its worst form may terminate in a few days, though generally its duration is from two to five weeks. The symptoms may be considered favorable when the griping pain and straining at stool diminish, and the motions are less frequent and more healthy in their appearance, while a gentle perspiration breaks out over the whole body, with abatement of the febrile excitement. It may be remarked that changes for the better will sometimes take place, resembling remissions; these may last for twelve or twenty hours, or longer, and be followed by a return of all the bad symptoms.

In warm climates, dysentery is witnessed in its most intense forms, and is very frequently complicated with great derangement of the biliary organs, or disease of the liver. With most of the symptoms of the first or most common variety, the tongue has a yellow coating or a white covering over its surface, and appears swollen or larger than natural; there is nausea and bilious vomiting, occasional chills, hot, dry skin, and quick, irritable pulse; the burning sensation in the rectum, and straining at stool, are very severe; the evacuations may be copious, yellow-colored, or of a dark brown color and uniform consistence; and sometimes they are frothy, and have a greenish, mixed appearance, with streaks of blood. The stools at the commencement, and even through the course of the disorder, may be little if at all tinged with blood, though usually in the last stage they are mixed with dark bloody matter. A dull, heavy, uneasy feeling is experienced in the right side, increased by pressing with the fingers under the ribs, the pain often stretching to the right shoulder, where there may be a constant aching sensation; there is sometimes a feeling of oppression at the chest; the patient is troubled with a harassing, irritating cough; and in the last stage the tongue is red, smooth, or dark-colored and dry. The first symptoms of dysentery, where the liver has been long diseased, are frequently a sensation of fulness and uneasiness at the stomach and right side, copious discharges of bilious matter, with pain of belly and griping.

CHRONIC DYSENTERY.

In chronic dysentery the pulse is but little disturbed, except towards evening, when it may be quickened and accompanied with slight feverish symptoms; the evacuations are much less frequent than in the acute states, and are seldom attended with much straining, though in general there is a griping or twisting sensation about the navel before each motion, which is entirely relieved after leaving the close-stool. There is not often pain or pressure over the belly (which may be swelled and hard, or flatter than usual), though sometimes there is a heavy feeling, or sensation of heat and soreness, as the patient may express it. The stools vary greatly, even in the same patient, at different times; they may be copious and of a dark-brown color, or white, like clay diffused in water; hence the disease has been called *white flux;* or there is feculent matter intimately mingled with blood; sometimes there is a bloody mucus mixed with a substance resembling matter (pus), or the evacuations have a marbled and greenish appearance.

Causes.—Dysentery prevails chiefly in autumn and the beginning of winter, during cold moist weather, following great heat or long-continued drought; or it may be induced by high ranges of temperature succeeding to moist and very wet weather. An attack may be brought on by exposure to cold and wet, or to the dews of night, particularly after fatigue; by wearing damp clothing, by scanty and unwholesome food or drink, eating acid or unripe fruits, the use of water contaminated with impurities, breathing air rendered impure by many persons being crowded together, as in camps, vessels, prisons, &c., and then the disease is likely to assume the typhoid and malignant forms, and may become highly contagious; by constipation and the accumulation of morbid biliary secretions, the use of intoxicating liquors in excess, very rich stimulating diet, exhalations from the soil and from marshes, as well as putrid animal exhalations and epidemic states of the atmosphere. In hot countries the disease is frequently associated with worms, particularly in the dark races, who are peculiarly subject to bowel complaints.

Chronic dysentery differs only in degree from the acute form, and arises from the same causes.

TREATMENT OF ACUTE DYSENTERY.

1. *Rest.* The patient must keep perfectly quiet, in a horizontal position. This is the first and great requisite to success.

2. A dose of castor oil and laudanum (10 to 30 drops). If the

patient is seen early, this old-fashioned treatment is excellent. It clears the bowels of irritating substances.

3. *Dover's powder*, or the *cold powder*, in doses of from three to five grains. The Dover's powder may be given in doses of ten or fifteen grains, if necessary. (See *Cold Powder* and *Dover's Powder.*)

The following prescription will frequently be found of service:—

Opium, six grains,
Ipecac, twenty-four grains,
Calomel, twelve grains,
Mucilage or syrup, as much as is necessary.
Mix, and divide into twelve pills. Take one every five hours.

4. Inject starch and laudanum into the bowels (twenty drops of laudanum to one ounce of starch), in order to relieve the straining and irritation, and the burning sensation.

5. *Sugar of lead* is sometimes given internally in the *form of the lead and opium pill* (half a grain of each in the pill), and is also injected into the bowels in the form of a solution (three or four grains to the ounce).

Hope's Mixture is often given for dysentery. The prescription is—

Nitric acid, one drachm,
Laudanum, forty drops,
Camphor water, eight ounces.
The dose is a tablespoonful.

6. *Give stimulants and tonics.*—Quinine, brandy, and opium all are good, and if necessary, when the patient is much exhausted, should be given freely.

Dysentery often becomes a disease of debility. The patient falls into a *typhoid* condition. This is always a bad symptom. This condition must be treated by tonics and stimulants.

Dysentery is a disease which sea captains and others who are beyond the ready call of a physician are obliged to treat. It comes on suddenly, and sometimes prostrates a large number of seamen at once. In such cases pains should be taken to thoroughly fumigate the ship, for the disease is always fostered by filth.

The diet of dysenteric patients should be of a mild and soothing character—chicken-water, rice-water, arrow-root, and beef-tea. The intense thirst may be checked by *chewing* bits of *ice.*

Dysentery within the tropics is often extremely insidious in its commencement; looseness of the bowels and slight griping pains may exist for weeks, unheeded by the patient, until exhaustion of strength and some aggravation of the symptoms compel him to take to bed; and though the attack has been apparently very mild, yet the delay which has taken place in commencing the treatment may lead to a fatal termination, whatever means be employed. I cannot, therefore, point out in too strong terms the necessity of attending at once to the slightest derangement of the bowels in tropical climates, since a gentle purgative, followed at night by fifteen grains of Dover's powder, or a pill, composed of two grains of opium and two grains of ipecacuan, repeated for a few nights, and the occasional use of the warm bath, will frequently put a stop to those symptoms which, otherwise, might have ended in danger or destruction to life.

TREATMENT OF CHRONIC DYSENTERY.

Chronic dysentery is treated on the same general principles as the acute form. What has already been said on the treatment of acute dysentery need not be here repeated.

In tropical climes chronic dysentery is very frequent, and sometimes quite fatal.

In addition to the treatment already laid down for acute dysentery, it is well to try the various *astringents*. The disease at best is obstinate.

Simaruba is found very serviceable in this affection. It cured a patient of mine in the Gulf of Mexico, after other measures had entirely failed. *Sugar of lead*, *sulphate of zinc*, *nitrate of silver*, *sulphate of copper*, and *tannic acid* may also be tried in succession. The doses of these medicines are given under their appropriate names, and prescriptions are found under *Astringents*.

It is absolutely necessary in this disease, but more especially in the chronic form, that the warm or rather tepid bath should be frequently used, in order to keep the skin clean.

With regard to regimen the patient must be particularly guarded, for medicine can be but of little avail if he be induced to satisfy those morbid cravings which are so frequently a symptom of this form of the disease. The diet should be mild, easy of digestion, and unstimulating, being chiefly composed of farinaceous substances, as rice, bread, sago, arrow-root, &c., with milk. The drink also must be mild and demulcent, unless in cases attended with much debility; and where there are no inflammatory symptoms, port wine in moderation may then be allowed, with water, or thin arrow-root, which is perhaps the best method of taking it; and those who have been in the habit of using spirits may take weak brandy and water.

DYSPEPSIA.

Dyspepsia is one of the most common, most fashionable, and most annoying of the nervous symptoms of our modern society. Within the past quarter of a century it has increased in frequency and with great rapidity, so that there are very few who pass through life without making its acquaintance.

It is a most capricious, fickle, and uncertain visitor. It appears when it is little looked for, and when we suppose that it has departed from our doors forever it may suddenly re-appear in a more hideous shape than before. It comes and goes without law or order or regularity, and oftentimes without any seeming dependence on our behavior. At some times we may violate all the rules of diet and of hygiene in general without suffering the punishment of dyspepsia; at other times the fiend seizes fast hold of us, and will not let go his hold though we pay the uttermost farthing of our debt to the laws of health.

As will be explained more distinctly in the section on "*Nervous Diseases of Modern Times*," dyspepsia is usually a *nervous disease*. It is usually a *result* of over-work, over-worry, over-confinement, bad air, bad and insufficient food, sexual excesses and genital disorders, the abuse of stimulants and narcotics, want of sleep, and in short of all influences that tend to depress the vital powers.

It is not brought on by *errors in diet* so frequently as is supposed. Those who are most careful, and even literal and rational in their diet, are frequently the *greatest sufferers* from dyspepsia.

It is brought on by the same diseases that bring on hypochondria, hysteria, nervous exhaustion, spermatorrhœa, paralysis, insanity, and other well-known nervous diseases. It often exists in connection with these and other nervous diseases; nearly all hypochondriacal, hysterical, and nervously exhausted patients are more or less dyspeptic.

Like all other nervous diseases, and like all other conditions of the body, both good and bad, dyspepsia is exceedingly *hereditary*.

Those who have ever suffered from dyspepsia—and who has not—will not need to be told what its symptoms are. For the benefit of those who have never experienced this malady—if there be any such—I present below a detailed explanation of the *symptoms*.

Accidental attacks of indigestion are of very frequent occurrence, and arise for the most part from overloading the stomach with food and indulging too freely in wine, spirits, or other intoxicating liquors. The principal symptoms are, a sense of fulness, weight, and uneasiness at stomach; foul tongue, a bitter taste in the mouth, nausea, loss of appetite, with a particular aversion to fat or oily substances, and sweet or insipid articles of diet; flatulency, sick headache, and sometimes heartburn. In such cases a gentle emetic of *ipecacuanha*, a draught of warm *chamomile tea*, or irritating the throat with a feather, in order to rid the stomach of the aliment with which it is overcharged; followed by a mild dose of *tincture of rhubarb*, *Gregory's stomachic powder*, or some other gentle laxative; and spare diet for a few days, so as to allow the weakened stomach to recover its tone—are the simple means to be resorted to for the purpose of restoring the healthy functions of the digestive organs. Other causes, however, besides repletion may give rise to an accidental fit of indigestion. Of these we may enumerate articles of food difficult of digestion; certain circumstances occurring shortly after a meal, as exposure to extreme heat or cold, the use of ices, and strong mental excitement; eating quickly after long fasting; constipation of the bowels; accumulation of bile or mucus in the stomach, &c. In all cases of this description, when the disorder can be easily traced to some accidental cause, the above treatment, if no inflammatory or feverish symptoms be present, will soon restore the stomach and bowels to a healthy state.

The chronic form of indigestion, depending on debility or functional derangement of the stomach, commences slowly, and often advances to a considerable extent without particularly attracting the patient's attention. The symptoms that indicate the approach of this insidious disorder are numerous, but we shall only notice those which most frequently present themselves: the sleep is disturbed, and the patient is restless during the night, but in the morning he sleeps heavily, beyond his usual hour of rising, and awakes unrefreshed, with a bitter taste in his mouth. He has very little appetite for breakfast, and can only relish savory articles of food; during the day he feels languid, and sometimes drowsy, particularly after meals; and has little inclination for exercise or mental exertion. After some time a sensation of dryness in the throat begins to be felt in the morning, attended with expectoration of gray-colored phlegm, and sometimes with slight sore throat. As the disease advances the appetite becomes more impaired, nausea and inclination to vomit are occasionally experienced; an unpleasant sensation of heat is sometimes felt at the stomach during the day; disinclination to exercise and mental occupation increases, and there is drowsiness after dinner. These symptoms are followed by a dull, heavy pain in the head, and a feeling of weight at the stomach, with flatulency and heartburn after eating. When this form of indigestion becomes confirmed, the face is pale, the eyes appear dull and heavy, the mouth feels clammy; the tongue is flabby, pale, or whitish, and more or less furred; there is a constant sense of fulness and distention in the belly; and the bowels are irregular, the evacuations being scanty and particularly fetid, or copious, and frequently containing bile and portions of half-digested food; the urine is clear, copious, and, after standing some time, deposits a reddish sediment indicating acidity in the stomach and bowels; or it may become turbid and deposit a whitish substance, showing an alkaline state of the contents of the stomach; the temperature of the body is lower than natural, the feet are often cold, and the pulse is soft and weak. When the disorder is of long continuance, other organs of the body become sympathetically affected; in some cases there is a troublesome dry cough, or there may be palpitation of the heart and intermitting pulse, which lead the patient, now low-spirited and timid, to suppose that his heart is diseased, and this idea preys upon his mind and tends to aggravate all the symptoms. The mental powers, particularly of application and memory, become impaired along with the general health and strength. The patient may remain in this state a considerable length of time, and then gradually recover, or the inflammatory form of indigestion about to be described supervenes.

TREATMENT OF DYSPEPSIA.

Dyspepsia, unless it is a result or symptom of *ulcer* or *cancer* of the stomach, is not a *fatal* disease.

Indirectly, by reacting injuriously on the cerebro-spinal system, it may bring on softening of the brain, or some incurable disease of the spinal coid. Possibly, also, it may help to bring on insanity. Yet I think that there is a tendency to charge dyspepsia with crimes of which it is not guilty. It must be remembered that dyspepsia is itself often a *result*, an *effect* of exhaustion of the nervous system, and that the brain-disease of which dyspeptic patients often die may itself be the cause of the dyspepsia.

The greatest mistakes in medicine, as on all other subjects, are made by confounding effects with causes.

I have very often observed that patients who in their early manhood, and perhaps in adult life, suffer from dyspepsia, in the decline of old age are affected with some disease of the brain or spinal cord. And yet I am not sure that, in such cases, even the dyspepsia is the cause of the disease of the brain. The morbid tendency in the nervous system may simply change its locality. It may leave the stomach, or the nerves that supply the stomach—*the solar plexus*—and go to the brain.

In the treatment of dyspepsia we must therefore consider:

First. That it is usually not so much a symptom of disease of the stomach as of general nervous exhaustion.

Dyspepsia that results from inflammation of the lining membrane of the stomach is merely a *local* disease.

Secondly. That the treatment must therefore be directed to the general system, and not to the stomach merely.

Thirdly. That the treatment must in the main be tonic in its character.

Those who understand these three principles are qualified to treat dyspepsia. Those who do not appreciate these principles will probably fail in their efforts to remove this disease.

Let it also be understood distinctly that dyspepsia *is a relievable and a curable disease.* The common impression that nothing can be done for the dyspeptic is very erroneous. It is true that little can be done for the dyspeptic by ordinary medication, directed merely to the complaining stomach; but with our modern systems of treatment it is one of the most *relievable and even curable of any of the nervous diseases of our time.*

The course of treatment for the dyspeptic is as follows:

1. *General electrization* (see article on *General Electrization*), used faithfully, skilfully, and perseveringly. For dyspepsia I know of no remedy so efficacious. To this subject I have given long and special attention, and I think that, without over-estimating this method of treatment, it may be regarded as the best of our remedies. In order to be successful it must be used with the judgment and the studious adaptation to each case that only experience can teach. General electrization is now being studied and employed by many physicians in various parts of the country, and will soon become much more widely known than it is at present. It takes time, both for the patient and for the physician who administers it; but the dyspeptic who is not willing to take time to get well does not deserve to get better.

2. *The Movement Cure.* (See article on *Movement Cure.*)—This is a most valuable remedy for dyspepsia, as for many other conditions of nervous debility. It should be directed by a practised physician. It takes more time than general electrization. A

patient may use the two methods of treatment at the same time. There is no necessary interference.

3. *A generous and palatable variety of food.*

The old-fashioned habit of "dieting for dyspepsia" was based on the radical error that dyspepsia was caused by over-eating. The reverse is very often the case. *Under*-feeding, going without meals, eating hard, dry, indigestible and ill-nourishing food, such as pork and boiled cabbage, and soggy bread and vile pastry—these errors of diet may cause dyspepsia, but rarely does simple and *regular over-eating of good food bring on permanent dyspepsia.*

The dyspeptic, above all others, needs to be *nourished.* Starvation is sure to work injury, and rarely fails to aggravate the disease. The dyspeptic should take his meals with good regularity—should eat plenty of fresh beef, mutton, lamb, chicken, turkey, and eggs, oysters, fish, light bread, white or brown, as may suit him best. He should *have a variety of food at each meal,* especially at dinner. He may, if he chooses, use with advantage light sour wine or cider with his meals instead of tea and coffee. Rhine wine is usually agreeable and beneficial to the dyspeptic.

In regard to the choice of food, each person must judge for himself, by his own experience. As a rule, dyspeptics find it to their advantage to abstain from pork, salt or fresh, hard-boiled eggs, soggy bread, heavy pastry, rich confectionery, and some of the vegetables; also from strong tea and coffee.

4. *Plenty of Sleep.*—Sleep is food for the nerves. Let the dyspeptic seek sleep at any time or at all times, whenever he may feel disposed. A short nap before dinner rests the stomach, and prepares it for the digestion of food.

5. *Spongio-piline and wet compresses worn against the pit of the stomach.* (See articles on *Spongio-piline* and *Water Cure.*)—Great relief for the pain in the stomach, and for the indefinable uneasiness and sense of "goneness" that dyspeptics feel, is afforded by the spongio-piline compress. It may be worn for days, and weeks, and months. Sometimes it affords relief of pain and distress in the stomach in half an hour from the time of application. The wet compress is also of use, applied in the same way, but is less neat and convenient than the modern spongio-piline.

6. *A liberal variety of moderate exercise in the sunlight.*—The great mistake of dyspeptics is to exercise too violently and too long. When a person finds out that he is suffering from dyspepsia, he often feels that it is his duty to take long walks, or to toil hard at the wood-pile before breakfast; to tramp fifteen or twenty miles a day; to exercise furiously in the gymnasium with dumb-

bells and on parallel bars. All this is an extreme. When the stomach is weak the body usually shares more or less in that weakness. This is especially the case in the so-called nervous dyspepsia. An engine that is poorly supplied with fuel, and in which the fire is half out, cannot be expected to draw as heavy a load of cars as an engine that is well supplied with fuel, in which the fires are briskly burning.

Just so, a man whose appetite is capricious, who cannot digest his food, and who is more or less starved, cannot be expected to perform as much labor as a man with a vigorous appetite, who thoroughly digests his food, and who is consequently well nourished.

The dyspeptic should always bear in mind these rules in regard to exercise:—

First. Never exercise hard or long before breakfast, for that is a blunder that is almost a crime.

Secondly. Never exercise very hard just before or just after meals, except in emergencies. It is not necessary to be squeamish on that point.

Thirdly. Take the kind of exercise which you most enjoy, if you are so situated that you can do so, and change from one form to another as often as you get tired.

Fourthly. Never exercise to absolute exhaustion, if you can avoid it.

For more detailed hygienic suggestions the reader is referred to my chapters on *Air*, *Sunlight*, *Exercise*, *Food*, *Stimulants*, and *Narcotics*. The views and facts therein presented are of special interest to the dyspeptic.

7. *Rest, travel, and change of occupation.*—For the dyspeptic, rest is oftentimes more useful than exercise. It is well to take short and frequent vacations, to throw off the cares and the trials of business, and simply vegetate in some quiet nook, when our humor may lead us. The nervous dyspeptic would do well to study and acquire the art of *lounging* or *loafing*. Some dyspeptics think that they are benefited by smoking, especially when the effect of the tobacco is to calm, to soothe, to make the hours glide easily and unconsciously. When tobacco has the opposite effect—to excite, to irritate, to increase nervousness—it probably injures the dyspeptic.

Travelling often cures dyspepsia, but it is by no means a certain remedy, nor is it necessary to a cure.

A sea-voyage to Europe often does good to the dyspeptic, not on account of the sea-sickness which it produces, but in spite of it. Sea-voyages, if not too long, are beneficial to dyspeptics in two ways. First, by giving him opportunity and means of *rest*, and quiet and freedom from the strifes and din and worry of business life on shore. (See *Sea-sickness*.)

Secondly, by the tonic and calming effects of the sea-air itself.

Mountain air and climbing mountains are better for many dyspeptics.

Internal remedies.—As a rule, *tonics and stimulants* best serve our purpose. Caswell's or Wyeth's elixir of iron and quinine are both good. (See *Prescriptions for Tonics.*) *Subnitrate of bismuth* is much used, and *sulphite of soda* is recommended in doses of five or ten grains.

Pepsin is much used, and in some cases it is certainly beneficial. But, after all, it is not well to place much reliance on internal medication. (For further remarks see *Nervous Diseases.*)

INFLAMMATION OF THE EAR.

Acute inflammation of the ear usually begins in the throat, and travels along the Eustachian tube to the middle part of the ear, or that portion of the organ of hearing situated between the membrane of the drum and the nerve. If unchecked, it may pass outward through this membrane, or to the brain. The latter result is very dangerous to life. Such an inflammation is usually the result of exposure to a draught, of getting the feet wet, or of similar causes of catching cold. There is great pain in the ear, noises in the head, and fever.

The treatment should be prompt and energetic. Leeches should be applied just in front of the external opening of the ear, and warm or hot water be kept in the ear constantly until the pain is subdued. A hot foot-bath should be given, and the patient kept in a warm room.

If matter has formed in the ear and is discharging, it should be removed from once to three times a day by syringing; and then an astringent of some kind, which has been previously warmed, say of alum, of the strength of one to three grains to the ounce, may be dropped into the ear. Deafness from imperfect action of the Eustachian tube, or the canal leading from the throat to the ear, is apt to remain after these attacks of acute inflammation, or it may occur of itself. The tube does not open as it should during the action of swallowing, consequently the interchange of air between the middle ear and pharynx is not effected; the drum-head of the ear sinks inwards, there being a greater pressure upon its outer than upon its inner surface; and deafness, or improper or imperfect conduction of the waves of sound results. In such cases the muscles that open the tube should be kept in action by a gargle of alum, or chlorate of potash, or cold water, while at intervals of twenty-four hours air is forced through the Eustachian tube by the following method:

The affected person takes a little water in the mouth, which he is instructed to hold there until he is told to swallow it. The operator then takes a tube of india-rubber, or the like, of about twelve inches in length, and inserts one extremity in one nostril of the patient, at the same time closing the other with the finger. He then places the other extremity in his mouth, and causes the patient to swallow at the instant he forces a column of air from his own lungs into the tube. He may indicate the proper instant by a gesture. The air will be forced against the mouth of the tube, and, in most instances, through the tube itself into the ear. This procedure may be repeated three or four times, and it is usually followed by considerable improvement in the hearing.

A chronic discharge from the ear should be treated by careful and daily syringing with warm water, afterwards dropping in an astringent such as has been mentioned, always warming it before use. It is a very obstinate affection, but it is also a dangerous one to life, and should always be carefully and thoroughly treated until the discharge ceases. Many children and some adults die every year in consequence of a neglect of a discharge from the ear.

Hard wax does not collect in the ear as often as has been supposed; when it does, however, it should be removed by syringing with warm water.

If a substance such as a button, bead, or the like, or any insect, has got into the ear in any way, it should be removed by syringing with warm water. No instrument should be introduced into the ear to remove any such substance, unless a thorough attempt has been made to remove it by syringing. If instruments are introduced, none but a competent surgeon should use them, and he will seldom or never need such an aid. Substances remaining in the ear will do no harm for a long time, while improper attempts to remove them have caused the greatest injury in many cases; and sometimes death has resulted from careless manipulation. Chronic affections of the ear that are unaccompanied by discharge can only be treated by a physician, and should never be meddled with by non-medical persons. They usually result from a chronic inflammation of the throat, which has extended along the Eustachian tubes to the ear.

EFFERVESCING DRAUGHTS.

Effervescing draughts are much used in fevers and inflammatory diseases, in order to quench thirst, check vomiting, moderate the heat of the surface of the body, and cause gentle perspiration. The one generally used is made as follows:

Take of subcarbonate of potash, or of soda, a scruple,
Syrup of orange-peel, a drachm. Mix, in a wine-glassful of water, and then add a tablespoonful of lemon-juice, or fifteen grains of citric or tartaric acid, in powder, dissolved in a little water.

The above may be swallowed while in a state of effervescence, or the alkaline solution may be first taken, and the acid immediately afterwards, so that the effervescence may take place in the stomach. In fever it is a common practice to add five grains of *nitre* to this draught, with the intention of increasing the determination to the skin.

A mild and agreeable effervescing purgative draught is made from the patent *Seidlitz powders*. These consist of two different powders; the one contained in the white paper consists of two drachms of *tartarized soda* (*Rochelle salt*), and two scruples of *carbonate of soda;* that in the blue paper, of thirty-five grains of *tartaric or citric acid.* The contents of the white paper are to be dissolved in half a pint of spring water, to which those of the blue paper are to be added. The draught is to be taken in a state of effervescence.

ELATERIUM.

Elaterium, or the dried juice of the *wild cucumber*, is the most powerful of all purgative remedies. It is principally used in dropsy, from the action it possesses of discharging through the bowels the water which has accumulated in the cavities of the body, or in the cellular substance under the skin. (See *Dropsy.*) When properly prepared, its action is as regular and certain as that of any other remedy. The dose is the eighth or the quarter of a grain, twice or thrice in twenty-four hours, which should be continued until copious evacuations are procured. In dropsy it is frequently used in the following form:

Take of the extract of elaterium, one grain,
Sweet spirits of nitre, two ounces,
Tincture of squills, and
Oxymel of colchicum (or meadow saffron), of each half an ounce,
Syrup of buckthorn, an ounce. Mix. The dose is a teaspoonful three or four times a day.

It has been used with advantage in gout and acute rheumatism, in combination with other purgatives, as follows:

Take of the extract of elaterium, ten grains,
Compound extract of colocynth, two drachms,
Jalap, and
Castile soap, of each a drachm,
Oil of juniper, a sufficient quantity to make a mass, to be divided into fifty pills: two or three a dose.

ELECTRICITY—ELECTRIZATION.

Electricity has been used for the treatment of disease for more *than a century*.

At first, sparks from the Leyden jar were employed. Then the electricity generated by frictional machines was used. These frictional machines are now exhibited among the philosophical instruments of our schools and colleges. All sorts of diseases were treated by this frictional electricity—paralysis, St. Vitus's dance, rheumatism, and many other conditions of disease were treated by this agent, and oftentimes with apparent or real success.

The *Voltaic pile* was also used to treat disease, and at one time it was thought that it would cure all maladies.

The profession, however, became disappointed with the results, and for these reasons:

1. *The apparatus of those days were not reliable.*
2. *They did not know in what diseases electricity was most useful.*
3. *They did not know how to apply the electricity.*

But in spite of all the efforts of these able men, electrization, for the reasons above given, fell into disrepute.

After the discovery of the induction current by Faraday, in 1834, a new impetus was given to this department. Masson and Duchenne and Remak in Europe experimented and wrote on this subject, and really created a new era for electro-therapeutics.

Since 1850, *thirty* or *forty different* books and pamphlets have been written on the application of electricity to disease.

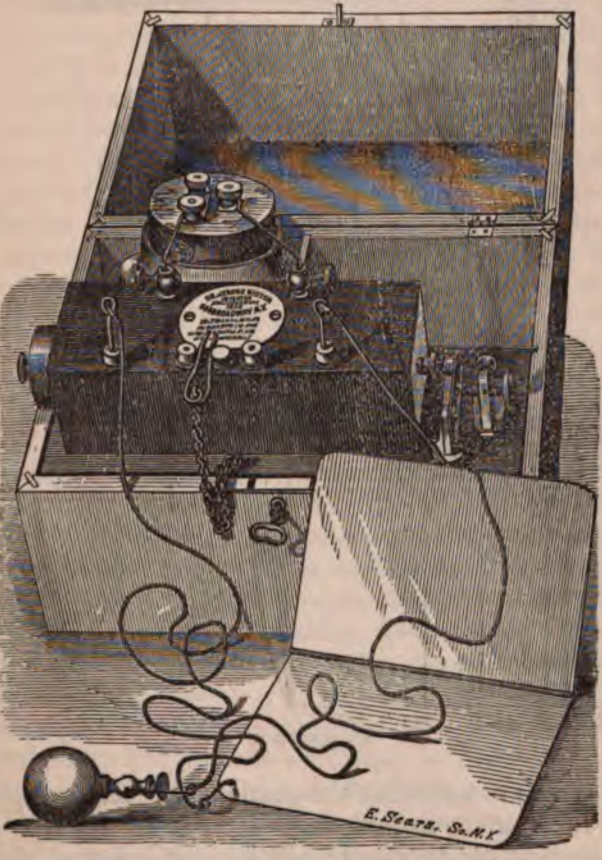
In Europe, electricity is largely used in the form of *localized electrization* for the cure of paralysis, neuralgia, and many other affections. It is exciting more and more attention. It is certain that in a few years it will be used much more than it is now.

In this country electricity has been until recently almost entirely in the hands of quacks, or at least ignorant men. It cannot be denied, however, that many of these have often been successful in their cases. The fact that such ignorant, reckless, unprincipled charlatans have been so successful oftentimes, is itself powerful evidence that *electricity* is an agent of very great efficacy in the treatment of disease.

METHODS OF ELECTRIZATION.

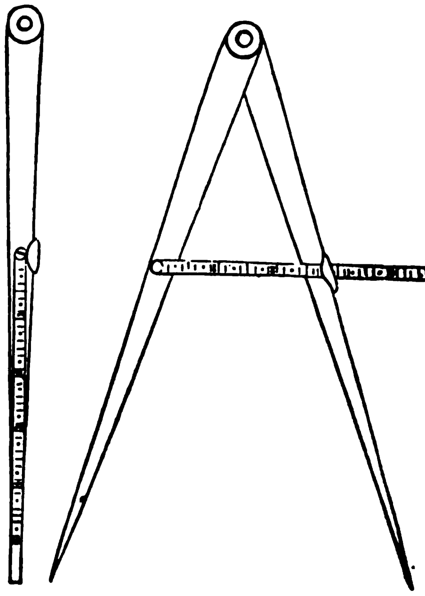
There are several methods of using electricity for the treatment of disease: *General electrization*, *localized electrization*, *partial* *electrization*, *galvano-puncture*, *galvano-cautery*, *and electro-puncture* are really modifications of *localized electrization.* (See *General Electrization* and *Localized Electrization.*)

Localized electrization was first employed by Masson, and was developed and popularized by the efforts and writings of Duchenne, of France. In this method the poles are applied near each other through separate parts or organs, with a view to local effects merely. It is chiefly used for *paralysis*, *neuralgia*, and *rheumatism*.


E. Sears, Sc. N.Y.

ONE OF THE FORMS OF APPARATUS FOR ELECTRIZATION.

ÆSTHESIOMETER.



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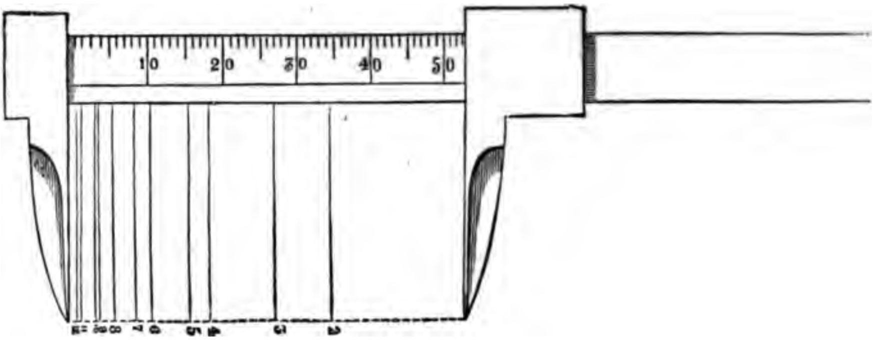


ÆSTHESIOMETER.

This is used to determine the sensibility of paralyzed parts.

The value of the æsthesiometer depends on this fact, that the *consciousness of the distance between any two points* applied to the skin, varies in different parts of the body, and is modified by disease. The ordinary compass with a graduated scale is much used. By the æsthesiometer we can also ascertain whether the paralytic is recovering, because usually the affected part as it gets better becomes more sensitive.

The ends of the fingers and tip of the tongue are the most sensitive portions of the body; the least sensitive parts are the back and outer portion of the thigh. This sensitiveness is greatly modified by paralysis. (See cuts of *Esthesiometer.*)

ELIXIRS of Quinine, Strychnine, and Pyrophosphate of Iron are now deservedly popular. (See *Prescriptions for Tonics.*)

EPILEPSY, OR FALLING SICKNESS.

In the great majority of cases the fits of epilepsy come on without any previous indication of their approach; but sometimes the following premonitory symptoms are experienced. Headache, giddiness, ringing in the ears, flushed face, low spirits, irritability of temper, the fancied appearance of certain objects before the eyes, and in some cases dilatation of the pupils, announce the approach of an attack. These sensations continue some time, perhaps a day or two, before the fit comes on; but in other patients the warning symptoms are of short duration, and of a different description. A feeling of pain, heat, cold, or tingling comes on suddenly in one of the toes or fingers, or in a particular part of the back or belly, then rises gradually through the stomach and heart until it reach the head, when the patient immediately falls to the ground as if struck with lightning. But in ordinary cases, at the moment when the patient least expects it, perhaps when conversing with his friends at table, he utters a loud unnatural scream, and falls down bereft of sense and voluntary motion, and violent convulsions instantly follow. In some cases, however, the convulsive movements precede the fall; particular motions or gesticulations of the limbs take place, or the head is drawn backwards or turned gradually round towards one of the shoulders, by a spasmodic action of the muscles of the neck, which appears very distressing; but in general the piercing shriek, the fall, and the convulsive movements follow each other with the rapidity of lightning. The muscles of the trunk and extremities of the body are violently agitated, and the patient is severely shaken; the limbs are alternately extended and flexed, the toes are curved inwards, the thumbs are firmly grasped in the palms of the hands, and it has been remarked that in many cases the muscles of one side of the body are more severely convulsed than those of the other. The convulsive action of the muscles of respiration causes the breathing to be at first slow and difficult, but after some time it becomes quick, irregular, and occasionally stertorous. The muscles of the belly and the bladder are acted on in a similar manner, so that in some patients the fæces and urine are expelled involuntarily. The face is swollen and red, or of a purple color; the veins of the temples and neck are enlarged; the face is drawn to the right or to the left, or the head may be drawn backwards or downwards on the chest. Sometimes the eyelids are closed, at other times wide open; the eyes are fixed and staring, or they roll in their orbits, the pupils remaining dilated or contracted, but always immovable. The face is violently distorted, the patient gnashes his teeth, and thrusts out his tongue, which is often severely injured; foam flows from the mouth, and is not unfrequently bloody, from the wounds inflicted on the tongue. The action of the heart is strong, tumultuous, and irregular; and the pulse is quick, small, and at times scarcely perceptible.

It seldom happens that the attack continues longer than a few minutes, but in some cases the patient becomes immovable for a short time, and is again suddenly convulsed. Sometimes a series of attacks and remissions follow each other in this manner during half an hour, an hour, or even considerably longer. In general, however, the convulsions gradually cease; perspiration breaks out on the forehead, neck, and breast; the breathing becomes natural, and is occasionally attended with sighing; the face loses its livid color, and appears pale. The patient now remains for some time in a sort of stupor, and is then restored to a slight degree of consciousness; he appears very drowsy and overcome with fatigue, and soon falls into a deep sleep. While in this state the perspiration breaks out freely over the whole body, the breathing becomes natural, the pulse full, soft, and slow; and after sleeping profoundly during several hours he awakes slowly, without retaining the slightest recollection of what has taken place. He may recover his senses immediately on awaking, but in most cases the power of voluntary motion, sensation, and consciousness return slowly, and a feeling of languor, weakness, and weight, or oppression in the head, with pain, or a sensation of soreness about the chest and limbs, is experienced for some time after.

When the fits recur frequently, and the complaint has been of long continuance, the memory fails, the intellect becomes impaired, the countenance assumes a vacant appearance peculiar to epileptic patients, and at last a state of idiocy is induced; but when the attacks appear at long intervals, without being immoderately severe, their influence on the general health and intellect is scarcely if at all perceptible. In fact, when confined within due bounds, epilepsy is not incompatible with the development of the most powerful intellect. Many celebrated men of all ages, military, political, and literary, have been affected with this disease; Julius Cæsar, Mahomet, Petrarch, Rousseau, and Bonaparte were epileptic.

Causes.—Idiots and people of weak minds are very subject to epilepsy. The hereditary influence of this disease is generally admitted; and it appears to be well understood that people of scrofulous habit of body labor under it more frequently than others. It is said to be more common in the lower than in the middle and upper classes of society.

The most frequent exciting cause is terror or sudden fright. For example, how often it happens that a nurse makes a sudden noise behind a child in order to stop hiccup, and that the infant, in consequence, falls instantly into a fit of epilepsy, which recurs from time to time throughout life. Sudden fits of passion, disappointment, distress of mind, and excess in venery, are the causes which rank next to terror in producing this disease.

TREATMENT OF EPILEPSY.

Comparatively few cases of epilepsy permanently recover under any treatment. The disease is, however, very frequently the immediate cause of death. Patients may live for years in spite of violent and frequently repeated attacks. It is a bad sign to have many attacks at night.

During the attack very little is to be done.

Loosen the clothing of the patient. Place him in a comfortable position. Give him fresh air.

For treatment during the intervals, the profession have now settled down upon a very few remedies. The chief of these is *bromide of potassium.*

This may be given to epileptics in very large doses, and for a long time. Occasionally, though quite rarely, the bromide of potassium produces unpleasant effects when given in large doses. For this and for many other reasons, epileptic patients should always, if possible, put themselves under the care of a good physician, and take the remedies under his direction. The bromide of potassium is frequently combined with the bromide of ammonium. (See *Bromide of Ammonium* and *Bromide of Potassium.*) Twenty and thirty grains at a dose may be taken of bromide of potassium for epilepsy.

A prescription somewhat like the following may be used by those who are beyond the reach of medical aid. It should not be taken for a long time without advice:

Bromide of potassium, one ounce,
Bromide of ammonium, half an ounce,
Iodide of potassium, quarter of an ounce,
Tincture of gentian, seven ounces.

The dose is a teaspoonful. Before bedtime a double or treble dose may be given.

Oxide of zinc, and *belladonna,* and *strychnine* are also given.

In those cases where the bromide of potassium does not succeed, it is well to try these others. It is unwise, however, to experiment much on one's self with these powerful remedies. They should usually be given under the care of a medical adviser.

General electrization is sometimes of service in epilepsy, and should be used, if possible, in connection with internal medication. (See *General Electrization.*)

Epileptic patients should carefully observe the laws of health in respect to diet, air, sunlight, bathing, sleep, and exercise, and should be very moderate in the indulgence of their passions.

Epilepsy is treated more successfully than formerly. By acting upon the principles above indicated, physicians are now able to diminish the frequency of the attacks, to lengthen the intervals, and sometimes to cure entirely.

The treatment, to be successful, must *be very persevering;* and, as a rule, patients must be content if they only get permanent relief, and not absolute cure.

Physicians are yet in the dark about the nature of epilepsy; but in the treatment of the disease we have certainly made progress.

When the attacks are of frequent occurrence, the patient must be carefully watched, and a piece of india-rubber, or a wedge-shaped piece of soft wood, should be always ready to place between the teeth, in order to prevent him from biting his tongue. It is scarcely necessary to mention, that he ought to avoid all dangerous situations, such as going near the edge of a precipice, sitting on the top of a coach, &c., and not walk near water, nor sit near the fire, unless it be completely protected by a strong wire fire-screen. An indulgence in venereal pleasures might prove fatal to an epileptic person.

EPSOM SALT, OR SULPHATE OF MAGNESIA.

Epsom salt is a well-known and very excellent purgative. In the dose of from two teaspoonfuls to an ounce, dissolved in half a pint of warm water, and taken when tepid, it acts freely, without griping. To prevent this salt from causing sickness at stomach, it may be taken in an infusion of orange-peel, or in any other aromatic or bitter infusion, to which two teaspoonsfuls of *tincture of rhubarb* may be added. It quickens considerably the action of the *infusion of senna-leaves;* hence it is frequently given in the form of the *black draught.*

Oxalic acid has a strong resemblance to Epsom salt, and has frequently been mistaken for it; the former, however, may easily be known by its acid taste when mixed with water, and by changing the color of blue paper to red. The antidotes against oxalic acid are powdered chalk or magnesia, followed by hot brandy and water, with small doses of laudanum.

ERGOT OF RYE.

This substance is principally used during labor, in order to assist in expelling the child; and there can be no doubt that it exerts a strong influence over the womb when given in suitable doses, and in the cases in which its use is indicated; under other circumstances it would produce the very worst effects, and is only, therefore, of value in the hands of a physician of experience.

The ergot of rye is now well ascertained to be one of the most efficacious remedies in arresting the alarming discharges of blood from the womb commonly called *floodings;* also in checking excessive menstruation, in gonorrhœa, the whites, and in all mucous discharges. But its most certain property is the power which it possesses of causing the womb to contract, and thereby expelling the child, and also the after-birth, in cases where it has been too long retained.

The average dose of the ergot, in powder, during labor, is twenty-four grains in a little water, or with the addition of a glass of sherry wine, which enables it to sit easier on the stomach; and it may be necessary to repeat the dose three or four times, at intervals of two or three hours. In cases of flooding, a drachm may be divided into six or eight doses, and given at longer or shorter intervals, according to the circumstances of the case. In whites, and other mucous discharges, the dose is from five to ten grains, three or four times a day; or twenty grains may be boiled in eight ounces of water, and taken in the course of two days. The *tincture* is made by macerating two ounces of the ergot in a pint of proof spirit for ten days. The dose, in cases of tedious labor or flooding, is two or three teaspoonfuls every twenty minutes. The *infusion* in common use is made with half a drachm of the ergot to half a pint of boiling water, and one-half administered at a time.

The ergot of rye must be kept in a dry place; if exposed to moisture it becomes useless; the greater part of that found in the shops is completely inert.

ERIGERON CANADENSIS (FLEABANE).

This medicine is an astringent. It is used in *diarrhœa* and *dysentery.* It has also been used in uterine *hemorrhage.* Recently it has been used for *gleet* and *irritation* of the bladder with good results. It is sometimes combined with oil of sandal-wood.

The dose of the oil of erigeron is from *three to five drops.*

ERYSIPELAS, ROSE, OR ST. ANTHONY'S FIRE.

Erysipelas is a peculiar inflammation of the skin, attended with fever, and frequently accompanied by elevations of the scarf-skin resembling blisters. Sometimes it is a mild disorder, confined to a small portion of the skin (*simple erysipelas*); sometimes the inflammation extends deeper than the skin (*phlegmonous erysipelas*); while in other cases it attacks the face, extends to the head, and is attended with very great danger to life.

Simple erysipelas is generally ushered in by febrile symptoms, such as shivering, headache, hot skin, quick pulse, sickness at stomach, or vomiting; pains about the loins, and lassitude; but many of these symptoms are absent when the disease is to be very mild in its nature. In the part which is about to be attacked, the patient often experiences a feeling of heat, itching, or weight. On the second or third day the inflammation makes its appearance, and is attended with the ordinary signs, viz., redness, heat, pain, and a certain degree of swelling. The color of the inflamed part is commonly deep rose, of a shining aspect, and soon spreads uniformly over the surface; it disappears under pressure made by the finger, and immediately returns again when the pressure is removed. The pain is of a pungent, burning kind, and is often attended with itching, or a pricking sensation; it extends all over the inflamed surface; the swelling is not considerable, unless the disease be very severe; it is uniformly spread over the inflamed part, and is more easily detected by the finger than by the eye. About the third or fourth day blisters of various sizes sometimes appear on the inflamed skin, but in other cases the inflammatory symptoms begin to subside on the fourth and fifth days, and soon terminate, without any accident, in a separation of the scarf-skin or cuticle from the true skin underneath.

Phlegmonous erysipelas is a more severe form of the complaint, which attacks the structures underneath the skin as well as the skin itself. It generally occurs in young, strong persons, and affects the limbs more frequently than any other part of the body. In phlegmonous erysipelas the fever is much more violent, and the pain more severe than in the former species; the swelling of the inflamed parts is more manifest, harder, and does not gradually disappear in the surrounding skin, but has more the feel of a tumor. When the disease has continued for four or five days, it may subside and disappear, as in cases of *simple* erysipelas; but it more frequently happens that, while the fever diminishes with the local pain and redness, the swelling of the part does not diminish in proportion; it becomes soft, continues to retain the impression of the finger, and in a few days matter is formed between the muscles and underneath the skin. In still more severe cases the matter extends along the cellular tissue, in the direction of the muscles, and destroys the adjacent parts, which are discharged in dirty-looking shreds of mortified substance mixed with pus; and this discharge may continue for weeks, until it completely exhausts the patient.

Simple erysipelas usually terminates on the third or fourth day; when blisters form it may continue for eight, ten, or even fifteen days; and in cases of a severe kind, where matter forms or the parts become mortified, the disease may last for several months. Erysipelas is commonly a mild disease, and terminates without any accident; but when attended by copious discharge of matter, or mortification of the cellular substance, it often ends in death. There is also much danger to be apprehended when it suddenly leaves any part (as the face, scalp, &c.) to attack the brain; or when it occurs in old persons of broken-down constitution, in drunkards, &c., or after severe injuries.

Causes.—Erysipelas is sometimes an epidemic malady, and prevails extensively in hospitals or crowded establishments. It frequently depends on some derangement of the digestive organs, a circumstance which is explained by the well-known sympathy between the skin and mucous lining membrane of the stomach and bowels; in other cases it is manifestly excited by some wound or injury of the skin. Finally, erysipelas prevails during the spring and autumn, and under certain conditions of the atmosphere which favor its production.

TREATMENT OF ERYSIPELAS.

1. *Relief of pain.*—This is accomplished by tepid fomentations —cloths wrung in tepid water and applied to the affected part. The common lead and opium wash is one of the best remedies to apply. It is very safe for those who are beyond the call of a physician. Besides this, ointment of oxide of zinc, or flour, may be spread over the affected part.

2. *To sustain the general system.*—Muriated tincture of iron, quinine, strychnine, may be used internally, with nourishing but easily digested food, such as beef-tea.

In the severer or "phlegmonous" forms it is sometimes necessary to make incisions and let out the pus.

INFLAMMATION OF THE EYE.

The eye is subject to a great variety of affections, and several forms of inflammatory disease; it will, however, be necessary for us to mention only the most common disorders.

EYE, INFLAMMATIONS AND DISEASES OF.

These are acute and chronic inflammation of the outside of the eye, inflammation of the tear passages, inflammation of the pupil, and inflammation of the retina and nerve.

The affection known as cataract should also be named, and glaucoma. (For method of examining the eye employed by physicians, see *Ophthalmoscope.*)

Acute inflammation of the membrane covering the lids and front of the eye—the conjunctiva—may be usually known by the following symptoms: The lids are more or less swollen, according to the severity of the attack. The eyelashes adhere together, and mucus or pus, or both, exudes from between the lids. The lids are also hot and red.

The eye is painful, and there is a sensation as if sand or particles of dust were in the eye. There is not apt to be any fever or disturbance of the general system. There is a very great difference in different cases in the severity of these inflammations. In some the heat, redness, and swelling of the lids are very great. The lids cannot be raised at all, and the matter is constantly flowing over the cheeks. In others the lids are very little swelled, and only a half-watery fluid exudes very slowly and in small quantities. The lids are glued together in all the cases, and there is the sensation of sand in the eye. The mild form of the disease is called catarrhal conjunctivitis; the severer, purulent conjunctivitis. The causes of the former are exposure to cold and dust, long-continued straining of the eyes, and so on.

The causes of the latter are the inoculation of the pus with matter from some source, sometimes with matter from the urethra which is affected with gonorrhœa. Sometimes the use of improper means of treatment in the catarrhal or simple variety of the disease will cause it to run into the purulent variety.

The treatment of the simple variety consists essentially in the use of cold water until the heat is subdued; then of an astringent, such as alum or sulphate of zinc, with an ointment to be rubbed in between the edges of the lids at bedtime.

The alum may be used in the proportion of one drachm to the pint of water; sulphate of zinc, two grains to the ounce; simple cerate or sweet oil may be rubbed between the lids at night. Poultices should never be used, no matter how made, of tea-leaves, oysters, bread and milk, and the like. They have destroyed thousands of eyes.

Purulent inflammation of the outside of the eye, or *purulent conjunctivitis*, is a very dangerous disease to the eye. It occurs very often in infants, and is then called ophthalmia of the newly born. It is the same affection as that which we have described above, and is to be treated in the same general way. The dangers to the eye are from ulceration of the transparent part of the eye, or of spots or opacities forming on it. Irreparable loss of vision sometimes occurs in forty-eight hours.

Treatment.—Perfect cleanliness of the eyes, whether they be those of an adult or of an infant, is the first and chief matter. This may be secured by means of soft bits of rags dipped in lukewarm water, or by a small sponge. Alum wash, a drachm to the pint, may be allowed to run through the eye four or six times a day. Ice-water should be applied over the lids during the early stages of the disease, taking care never to allow the applications to become hot. The coldness of the water should be moderated as soon as the lessening of the swelling of the lids and the subsidence of the discharge show that the force of the inflammation has abated. Simple cerate should be smeared between the lids at night. Morphine or opium may be given *to adults only*, to quiet severe pain. The patient should remain in bed, in a half-darkened room. Great care should be taken that none of the matter from the diseased eye enters into the eyes of any of the attendants.

The chronic inflammations of the outside of the eyes, or *chronic conjunctivitis*, are characterized by the following symptoms: Redness of the edges of the lids, thickening of the lids, and glueing of the edges in the morning. Mild astringents, eye-washes made of alum or sulphate of zinc, tannic acid, with an ointment, are the best means of treatment. All these astringents may be used in solutions of about two grains to the ounce of water. Tannin should be mixed with glycerine. The general health should always be attended to by fresh air, exercise, bathing, and so on.

Blue glasses to protect the eye from excessive light may be worn in all the chronic inflammations of the eyes, or a blue cloth or paper shade shaped like a cap front.

Children and even adults are very liable to an affection of the eyes which was formerly known as scrofulous ophthalmia, but since it arises where there is no scrofula in the system is better known as pustular ophthalmia, or pustular conjunctivitis. The chief symptoms are dread of the light; the child will bury its head in the pillow or in its mother's lap, and the adult who sometimes has the same disease can scarcely be induced to hold his head up and his eyes open even for a moment. There is also a great deal of watering of the eyes. On close observation pustules or red points may be seen on the white coat, or on the transparent part of the eye, or on both.

The patients with this affection are usually improperly or half fed. They need good food, such as beef and mutton, milk, eggs, and the like, with fresh air, frequent bathing, and exercise. Abstinence from tea and coffee, pastry and confectionery, is to be especially enjoined. The eyes themselves need very little attention beyond bathing with lukewarm water. A belladonna wash (aqueous extract of belladonna, two drachms; water, four to eight ounces) may be applied to them twice a day.

Inflammation of the pupil of the eye, or *iritis*, is usually characterized by great pain in the eyeball and in one side of the head, and by fear of light, so that the patient attempts to keep his eye closed. It is a very dangerous affection to the sight. It depends chiefly on the poisoning of the blood by syphilis or rheumatism. The chief local remedy is sulphate of atropia, of the strength of one to three grains to the ounce of water, one drop of which should be placed in the eye by means of a camel's-hair brush or the like, once to four times a day. The syphilis or rheumatism, if manifesting itself in the other parts of the body, is also to be treated.

Inflammation of the tear passages may be recognized by the running of the tears over the cheeks, and usually by a little tumor or swelling in the inner corner of the eye. Sometimes an abscess forms here. A surgeon will treat such a case by slitting up the canal leading along the edge of the lid to the corner of the eye, and then by probing the passage into the nose.

Cataract is an opacity of the lens of the eye, and is only to be cured by the removal of the lens from the eye. The operation of removing the lens of the eye is one of the most delicate and difficult in surgery. None but a person who has paid especial attention to diseases of the eye and their treatment should ever operate for cataract. An opacity of the outside of the eye is not a cataract.

Cataract may be caused by an injury to the inside of the eye. A needle or any sharp substance passed into the lens will cause it to become cataractous.

Children are sometimes born with cataract. The disease is more common in old persons, however. The causes of opacity of the lens in old people are not very well known. About 80 per cent. of those operated upon by extraction of the lens for cataract, by good surgeons, recover their sight. Patients who have been operated upon by removal of the lens are obliged to wear cataract glasses, or double convex lenses, to replace the lens that has been taken from the eye.

Glaucoma.—This is a painful affection of the eye, that is very dangerous to sight, and which is often mistaken for neuralgia of the head, because it is often accompanied by very severe pain in the temples and face. It is sometimes mistaken for cataract, because the lens becomes opaque as a result of the disease. In true cataract there is no pain.

Glaucoma can only be certainly recognized and treated by a surgeon. The prominent symptoms are pain in the ball of the eye and in the head, and rapidly increasing loss of sight. The eyeball becomes as hard as wood when the disease is far advanced, and the lens becomes of a greenish color; hence the name given the disease by the ancients: *Glaucoma*—literally, *green tumor.*

The only proper treatment for glaucoma is an operation, first performed for this disease by Prof. Græfe, of Berlin. This operation consists in cutting out a piece of the *iris* or *pupil.*

MUSCULAR AFFECTIONS OF THE EYES.

The muscles of the eyeball often become weakened from excessive use on near objects, and the pain and discomfort are so great as to cause the patients to believe that they have some dangerous disease of the inner part of the eye. The eyes water, become red, and the sight blurs on every attempt to use the eyes in reading, writing, or sewing.

Such a weakness of the muscles may depend on over-use of the eye, or on faulty conformation at birth. Rest will cure the one, while appropriate spectacles are required for the other.

A FEW SIMPLE RULES FOR THE CARE OF THE EYES.

1 Cold water is about the safest application for an inflamed eye.

2. Poultices are never to be used.

3. No one should read or sew, or use the eyes for any work on objects close at hand, *before breakfast or immediately after a full meal.*

4. *Bad air and bad food* make many diseased eyes; therefore avoid unventilated rooms, and sloppy, unnutritious food.

5. Nearly all persons, except short-sighted ones, should *use glasses* to read with as soon as they begin to hold a book more than *eight inches from the eye.*

6. Short-sighted persons should use glasses for seeing objects at a distance.

7. *Glasses properly chosen save sight, and do not injure it.*

8. Always hold a book so that the light will strike it *over the shoulders* of the reader—that is, from behind.

9. Do not use home prescriptions, or quack ointments and eye-washes for diseased eyes, but consult a surgeon as soon as possible.

INJURIES TO THE EYE.

If a bit of steel or any other substance has entered the eye, it should be removed by competent hands as soon as possible. If it be left in the eye, not only the sight of the affected eye, but of its fellow, will be lost, by what is known as sympathetic inflammation of the eye. Other injuries, where no substance has entered the eye, are treated in a manner similar to that advised for inflammation of the outside of the eye—that is, by the use of cold water, and if necessary by the use of some eye-wash. The simpler the eye-drops the better. Those of alum or the sulphate of zinc, used in the proportion of one to three grains to the ounce of rose or distilled water, are the best.

Concerning the use of the substances that compose eye-washes, Stellwag makes the following suggestive remarks:

"The acetate of lead and corrosive chloride of mercury are least to be recommended, on account of their great liability to decomposition. Sugar of lead is, besides, dangerous when there are ulcers on the cornea or conjunctiva, since it readily forms a deposit on their floor. This becomes encapsulated, and causes various evil results. Nitrate of silver and sesquichloride of iron cause stains in clothing which are not easily removed. Tincture of opium readily forms a sediment, and therefore acts unequally. The sulphates, especially the sulphate of zinc, should therefore have the preference in catarrhal inflammation, especially if the results of some recent experiments should be confirmed, according to which sulphate of zinc contracts the vessels more powerfully than any other agent, except cold."

There is little question that many injure themselves by recklessly abusing popular eye-washes, of the composition of which they know nothing. It is better to let the eyes alone than to tamper with them, when we do not know the real nature of the difficulty.

FAINTING OR SWOONING.

Fainting is for the most part a symptom of some other affection, rather than a disease in itself. It often accompanies disease of the heart, and may be brought on by any very painful disorder; by loss of blood, excessive discharges or evacuations; debility, however induced; and by sudden and violent mental emotions. Females and delicate people are most subject to fainting; in the former it is often brought on by wearing stays too tightly laced, and by sitting with the back to the fire during meals. Some people, from peculiarity of habit, swoon on seeing blood or any disagreeable object; in others the same effect is produced by pungent or disgusting smells.

Fainting, in connection with hysterical affections, is never attended with danger; but when it arises from obstruction in the heart or great blood-vessels, at the commencement or during the course of fevers, or from extreme debility, it is to be viewed in a more serious light, and its source should be ascertained. This affection, in fact, is only to be dreaded when the cause which gives rise to it is of a dangerous nature. A common fainting fit is usually of very little consequence, and often occurs in people otherwise in good health.

Treatment.—Nature alone, in ordinary cases, is able to effect restoration in a few minutes, if the patient be placed in the horizontal position, which is the first thing to be done to arrest the fit. Removing the patient to a cooler apartment, or exposing him to a current of cold air, sprinkling cold water on the face and hands, rubbing the left side of the chest with *eau de cologne* or any other stimulating fluid, and applying *hartshorn* or *aromatic vinegar* to the nostrils, are the simple means usually resorted to for the purpose of rousing the individual. Internally, a little brandy and water, or a teaspoonful of *æther*, may be given as soon as he is able to swallow.

In severe and protracted fainting-fits, consequent on flooding after delivery, it becomes absolutely necessary to administer brandy or wine, and laudanum, in small and frequently repeated doses, in order to restore animation and prevent the recurrence of the fits. Fainting, in such cases, is not unattended with danger, and the frequent renewal of the fits might soon prove fatal; the dread, therefore, of increasing the flooding by the stimulating action of these remedies on the system ought not to prevent their use, since it is obvious that to prevent the patient sinking from exhaustion, her strength should be supported at all hazards.

FARADAIZATION (French, *FARADISATION*).

This term was applied by Duchenne to the medical use of the Faradaic current. *General electrization* is usually applied with the Faradaic current.

Both Faradaization and galvanization aid the physician in diagnosticating disease—in finding out the complaint from which the patient is suffering. (See *Electricity*, *Galvanization*, and *General Electrization.*)

FISTULA.

A fistula is a narrow, open abscess. A very common form is the *fistula in ano.* Fistulæ are to be treated by pressure, caustics, stimulating injections, &c. It is frequently necessary to resort to an operation.

FLOODING.

By flooding we here understand those sudden and copious discharges of blood from the womb which take place soon after the birth of the child. Flooding may occur under two different circumstances, which it is of importance to distinguish; either the after-birth (*placenta*) remains in the womb and is the cause of the bleeding, or the after-birth has been expelled, and the flooding depends on want of proper contraction in the womb, to close up the open mouths of its vessels.

In the first case—that is, when the after-birth remains in the womb—we can only stop the bleeding by removing the after-birth. This operation, however, must not be attempted without due consideration. When the woman has been reduced by the loss of blood to a very dangerous state, shown by the constant fainting, absence of the pulse, and coldness of the skin, it would be improper to remove the clots of blood in the genital parts, or disturb the patient in any way, lest the bleeding return, and quench the feeble spark of life which remains. But when the patient has rallied under the use of small quantities of brandy and other cordials, or when the flooding has not been extremely copious, then an effort may be made to remove the after-birth. This is to be done by *very gently* pulling the navel-string, or by rubbing the lower part of the belly with the hand; by pouring cold water on the belly, and by giving the *ergot of rye;* three or four teaspoonfuls of the tincture, or half a drachm of the powdered ergot, may be administered every twenty minutes, during *one* hour, until the desired effect is produced. Should these remedies fail, a silk pocket-handkerchief should be passed into the vagina, and gradually pushed up against the womb, until the genital parts are completely filled; this done, medical assistance must be immediately sought, for the only way of stopping the bleeding effectually is to pass the hand into the womb and bring away the after-birth.

Flooding may occur, however, even when the after-birth has been entirely expelled. Here we must endeavor to make the womb contract, by rubbing the lower part of the belly smartly with the hand; by applying very cold cloths over the same part; or by placing a firm pad over the womb, and then binding it around the body with a linen or flannel bandage, as tightly as the woman can bear it with comfort. The *ergot of rye* must be given at the same time, in the doses which we have just mentioned.

In some cases the flooding is internal; that is, the blood continues to be discharged into the hollow of the womb, where it collects in large quantities, and does not find its way out through the genital parts. This is a very dangerous form of flooding, because, as there is no external appearance of blood, it might easily be supposed that the woman was not suffering from the disease. The existence of internal flooding may be suspected when the womb can be distinctly felt rising for some height at the bottom of the belly; and when at the same time the patient complains of ringing in the ears, giddiness, and an inclination to vomit. If the face now become suddenly pale, the pulse sink, the skin become cold, and the woman frequently faint, no time is to be lost; the means before described are to be employed, and should they fail, the hand must be passed up into the womb, in order to remove the clots of blood and excite the womb to contract upon it.

As a general precaution during the treatment of flooding, we should mention that the patient must be kept perfectly quiet, in a cool room, and that she should never be suddenly raised from the lying posture, or be permitted to make any bodily exertion whatever.

The management of the patient, after flooding has ceased, requires very great care and caution. When the loss of blood has been excessive, the woman is reduced to the lowest state; complains of a constant feeling of sinking, and is extremely restless and depressed in spirits. Notwithstanding her desire to change posture, she must be kept at rest; forty drops of *laudanum* or two grains of *opium* are to be given, and, if necessary, repeated in the course of an hour. When a little sleep has been thus procured, some light nourishment may be allowed, such as beef-tea or jelly, given in small quantities and frequently repeated; and when the stomach begins to recover itself the diet may be cautiously improved.

Diarrhœa, or looseness of bowels, may be checked by the *chalk mixture, with opium*, or any other mild astringent.

One of the most frequent and distressing effects of severe flooding is *headache*, which often lasts for several weeks, in spite of our efforts to relieve it. The headache in this instance depends upon loss of blood, and the patient should be nourished as rapidly as possible.

FOXGLOVE. (*Digitalis.*)

Foxglove is one of the most beautiful and useful of our indigenous plants. It grows on sandy and gravelly banks, in woods and uncultivated places, and flowers in June and July.

Foxglove is directly sedative, and possesses the peculiar power of depressing the circulation of the blood; when given in full doses it reduces the pulse from seventy-five to forty-five or forty beats in a minute, rendering it at the same time feeble and frequently intermitting. If given in too large doses it produces giddiness, dimness of sight, nausea, faintness; and then vomiting, swooning, convulsions, stupor, and death.

From the influence which this remedy exerts in lowering the action of the heart, it is of great service in enlargement, and other affections of that organ attended with increased action; and is used on the same principle at the commencement of pulmonary consumption, in spitting of blood, bleeding from the nose, and in excessive discharges of the menstrual fluid.

In dropsy there is no diuretic medicine so powerful and certain in its action as foxglove, more especially in dropsy of the chest; and it is much used in all inflammatory affections after the circulation has been to a certain extent diminished by blood-letting.

The *powder* of foxglove should be kept in opaque bottles, and ought not to be used if deprived of the green color and peculiar odor of the fresh plant. The dose is one grain every five or six hours, or oftener, until it begins to act on the system, and then the quantity must be gradually diminished, or given at longer intervals. The dose of the *tincture* is ten drops, gradually increased to thirty, three times a day; and of the *infusion* one or two tablespoonfuls may be taken twice a day in a little cold water.

It is a remedy that should not be used indiscriminately by patients. Even those who cannot obtain a physician may dispense with it, or substitute some other remedy.

FRECKLES. (See *Skin, Diseases of.*)

GALL STONES.

Gall stones form in the gall bladder. In their passage through the common duct to the intestine they give rise to great pain. The paroxysm of pain which they cause may be confounded with colic, inflammation of bowels, and neuralgia of stomach. There is great pain, vomiting, tenderness over left side, yellowness of the skin and eyes, and sudden relief of pain. They have very nearly the same symptoms as neuralgia of the stomach, which is called GASTRALGIA. Ordinary *colic* has some of the same symptoms.

The pain of the paroxysms may be relieved by the use of opium, hypodermic injections of morphine (see *Hypodermic Injections*), and hot fomentations.

It is said that patients have been cured of gall stones by taking daily large doses of *olive oil.*

GALVANIZATION.

There are two kinds of current used in *electrization*—the *galvanic* and the *Faradaic*, respectively named from Galvani and Faraday.

These names of electro-therapeutics are indefinite and much confused. I will not here attempt to give half of the different names that are applied to these two currents, nor to explain in detail the difference between these currents. In the majority of cases I employ the Faradaic current, and find that, in the hands of those who understand it, it is for most diseases more useful than the galvanic, and withal is less liable to injure. (See *General Electrization.*) In Germany the galvanic current is used more than the Faradaic. Within the past few years a large number of treatises have been written in Germany on the use of the *galvanic current alone.*

GAMBOGE.

Gamboge is a gum resin, brought principally from China. The species of the tree from which it is produced is not yet accurately ascertained.

This substance is powerfully purgative, and was formerly much used to expel the tape-worm. It causes watery evacuations, and is therefore sometimes given in dropsy along with cream of tartar, or in combination with the sulphate of potash.

The dose, when taken alone, is from two to six grains, mixed with a little syrup or honey, and a few grains of powdered cinnamon. Gamboge is usually taken in the following form: "Gamboge, powdered, a scruple; aloes, powdered, a scruple and a half; ginger, powdered, half a scruple; Castile soap, two scruples. Mix well together, and divide into five grain pills." These are the *compound gamboge pills* of the London Pharmacopœia, which, in doses of from two to four, act very effectually in opening the bowels.

GELSEMIN.

This is one of our new remedies, and has not yet come into very general use. It is given in *fevers*, in *seminal emissions*, in *epilepsy*, in *convulsions*, and to expel worms. It is a remedy of some power, and should be used with caution. Bad results have come from an overdose. As yet it is hardly to be classed among the domestic remedies. The dose is from *one-fourth* of a grain to *two grains*. The value of this remedy has not yet been established. It is claimed by some that it will cut short fevers and arrest attacks of acute rheumatism.

GENERAL ELECTRIZATION.

This is a term which I have given to the application of electricity all over the body. (See *Electrization.*)

General electrization is a tonic, and is used for those cases and conditions of disease where tonics are needed. It is not a *specific* any more than quinine, or strychnine, or iron is a specific. Like quinine, strychnine, cold bathing, exercise, sunlight, and so forth, it is a tonic, and is to be used when tonics are needed, without regard to the *name* of the disease. It meets with its best success in *dyspepsia, neuralgia, St. Vitus's dance, hypochondriasis, hysteria, sleeplessness, nervous exhaustion, some forms of paralysis, some diseases of women, and general debility.* It is also useful in *subacute rheumatism.* In *chronic rheumatism, in gout and rheumatic gout* it does not usually accomplish what we wish, though it may afford some relief. For nervous dyspepsia and for neuralgia I know of no remedy that can be compared with general electrization.

It is needless to say that it meets with failures.

On the other hand it must be allowed that it very often succeeds in cases of *dyspepsia, chorea, nervous exhaustion, neuralgia, hypochondria and hysteria,* &c., when other internal remedies have utterly failed.

In paralysis, neuralgia, and rheumatism *general electrization* succeeds as well or better than the method of *localized electrization* that is used in Europe.

It possesses these *advantages over localized electrization* (see *Localized Electrization*):

1. *In a large variety of diseases it is more efficacious.*
2. *It is more agreeable to the patient.*
3. *It is more convenient for the operator.*

GENTIAN.

This plant grows in great abundance in Switzerland and Germany; its root is highly esteemed throughout Europe as one of the most powerful and most useful of the bitter tonics. This remedy is very serviceable in indigestion, in general debility, and also in tedious convalescence, particularly in those cases in which the patients have a pale and waxy appearance of countenance, with loss of appetite, slow digestion, weak pulse, and a tendency to swelling of the ankles at bed-time. In scrofulous cases, where strengthening medicines are indicated, there is no better tonic than gentian.

The dose of the *infusion of gentian* is two tablespoonfuls or a wine-glassful twice a day. Of the *extract*, ten grains to half a drachm twice or thrice a day. Of the *tincture*, a teaspoonful in a little cold water. These preparations form the basis of nearly all stomachic or tonic remedies.

GLAUBER'S SALT. (*Sulphate of Soda.*)

It is a mild and sure purgative, in doses of from two drachms to an ounce and a half, and was formerly much in use, but at present Epsom salts are almost invariably preferred.

GONORRHŒA (*or Clap*).

Gonorrhœa consists in a discharge of yellow matter from the genital parts of the male or female, excited, in all cases, by the application of a contagious material from one individual to another. In males the discharge comes from the inside of the urethra or passage to the bladder; in females, from any part of the membrane which lines the genital parts. The infectious matter which excites gonorrhœa is generally communicated during unclean coition; but it has been proved beyond all doubt that a discharge exactly similar to that of gonorrhœa may, under certain circumstances, be produced by connexion with a woman whose genital parts are perfectly sound. Gonorrhœa may commence at any time after impure connexion, but usually begins from the third to the seventh day, by an itching at the orifice of the urethra, which, if examined, appears to be unusually red and a little swollen. Soon afterwards a slight running takes place from the urethra, of a whitish fluid, and this gradually increases in quantity, while at the same time it becomes more thick, until at last thick yellow matter issues from the canal. The disease is now fully established, and gives rise to pain during the passage of the urine (*scalding*); sometimes this pain is extremely severe, but in other cases the patient scarcely feels any uneasiness of the kind during the whole course of the disease. In ordinary cases of gonorrhœa the peculiar inflammation of the urethra, which constitutes the disease, does not extend up the passage beyond two inches from its orifice; when the inflammation is acute or passes further up the scalding is very severe, the under surface of the urinary passage becomes hard, feels like a cord, and is very painful to the touch; the stream of urine is diminished from the swelling of the parts which surround the urinary passage, and blood is often discharged with the urine, from the bursting of small inflamed blood-vessels. The patient should not be alarmed at this mixture of blood in his urine, even when the quantity of blood is pretty considerable. When the inflammation or irritation extends from the urinary passage to the spongy substance which surrounds it, a very painful affection of the genital organ, called *chordee*, is excited; and when the irritation reaches the bladder the patient cannot retain his urine for a moment, but is compelled to empty the bladder as soon as ever the desire to make water is felt; if he attempt to keep in the urine, an intolerable pain is produced in the bladder and in the extremity of the genital organ, exactly similar to what happens during a fit of the stone.

Gonorrhœa is often attended with two unpleasant consequences, which arise from the irritation extending to the glands in the groin, or to the testicles. In the first case a hard painful swelling (*sympathetic bubo*) appears in one of the groins; in the second case the inflammation extends along the seminal ducts down to the testicle, which becomes swollen and extremely painful to the touch (*swelled testicle*).

When a proper attention is not paid to cleanliness during the course of gonorrhœa, or the extremity of the genital organ is unusually irritable, the discharge of matter is apt to produce small sores on the end of the penis, and to cause inflammation of the foreskin. If this state be neglected, the foreskin sometimes swells to such a degree that it can not be drawn back over the end of the penis, or what is still more dangerous, when the foreskin has been drawn back it contracts like a tight cord round the end of the genital organ, cannot be pulled forward, and sometimes gives rise to mortification of the part.

We have as yet described gonorrhœa only as it exists in men; when women are affected the disease is generally more mild, and not so apt to irritate the bladder or to produce swelling in the glands of the groin. The pain is commonly slight and soon disappears; the scalding also is more frequently absent altogether, and the running soon terminates in a discharge of matter which bears a close resemblance to the whites, or *fluor albus.*

The time during which a gonorrhœa lasts is extremely variable; if left to itself the inflammation usually subsides in four or five weeks, and turns into a chronic discharge (*gleet*) of slimy mucus from the urinary passage, without any pain, scalding, or unpleasant symptom; but it will always be prudent to endeavor to cut short the disease, not so much on account of any danger attending it, as of the disagreeable consequences to which it often gives rise.

TREATMENT OF GONORRHŒA.

1. *Rest.*—Gonorrhœa is a disease of inflammation, and needs quiet. In severe cases the patient should keep in a recumbent position. Simple and unstimulating diet.

2. *Demulcent drinks,* such as flax-seed tea or tea of marsh-mallow.

By these methods alone, well persevered in, severe cases of gonorrhœa may be cured.

3. *Injections into the urethra.*

For this purpose various substances are used—sulphate of zinc, or sulphate of copper, or of nitrate of silver (*two or three grains to the ounce of water*). I present below more specific suggestions on this too important subject. I may say, however, that any one who is so unfortunate as to contract this disease makes a serious mistake —indeed, commits a crime against himself—if he does not consult some good medical authority. The worst consequences may come from self-treatment. Patients are very apt to overdo the matter of injections, and thereby may bring on serious, and perhaps incurable diseases.

These same remarks will apply to syphilis and all other important maladies of the genital organs. Self-treatment for such affections especially is oftentimes worse than no treatment at all. It is better, however, to have *no treatment at all, or to doctor one's self, than to consult any one of the vast army of charlatans who advertise to cure these diseases.* Thousands have lost their health and their lives by intrusting to these abominable harpies the cure of their private diseases.

I am well aware that many, very many—especially seamen—are so situated that they cannot obtain medical advice of any kind when they contract these diseases, and for the benefit of such I give the treatment in detail.

But, after all, the best way to cure these diseases is to *prevent* them; the surest way to prevent them *is to abstain from impure intercourse.*

When *copaiva* is employed, from twenty to thirty drops may be given three times a day, on a bit of sugar (see *Copaiva*); or in the following manner, as recommended by Sir A. Cooper:

Balsam of copaiva, one ounce,
Mucilage of gum arabic, one ounce,
Camphor mixture, four ounces. A tablespoonful to be taken night and morning.

To conceal the unpleasant taste of the balsam, it may be rubbed up with magnesia into a kind of soap, and then made into pills; the dose then being from twelve to twenty grains.

The *copaiva* or *cubebs* may be continued for eight or ten days, beyond which it would be useless to employ them if they do not produce any good effects. We must then have recourse to injections, which are to be thrown into the urinary passage by means of a small syringe. People have often a dislike to use injections lest the fluid pass up into the bladder. There is no fear that this will happen. The sides of the urinary passage lie in close contact with one another, and fluid cannot be driven into the bladder with the ordinary syringe; besides, we should remember that in no case is it necessary to push the injection with force; if it pass for a couple of inches into the urinary canal this will be sufficient. The following substances may be used for injections:

Sulphate of zinc, six grains,
Water, four ounces.

Sulphate of copper (blue vitriol), one grain,
Rose-water, two ounces.

Nitrate of silver, five grains,
Water, one ounce.

The fluid is to be injected two or three times a day into the orifice of the urinary passage: one injection may be substituted for another, and the strength may be gradually increased by adding half a grain, or even a grain, of each substance to the water. As a general rule, it will be prudent not to commence injections before the disease has lasted for ten or twelve days; but under urgent circumstances it may sometimes be cut short by injecting the *nitrate of silver* (ten grains to the ounce) as soon as the pain and scalding are discovered.

We have now to describe the treatment applicable to the different accidents which may arise during the course of gonorrhœa. Severe inflammation must be subdued by leeches, purgatives, and cold lotions. When the matter accumulates underneath the foreskin the parts should be washed two or three times a day in tepid water, and if there be any small sores about the root of the foreskin these should be dressed with a small quantity of *zinc ointment* on a piece of lint. If the bleeding from the urinary passage be copious, it may be arrested by ice-cold lotions to the genital organ, and cooling drinks. The *chordee* and painful erections which almost always attend severe gonorrhœa may be relieved by the following draught, taken before going to bed:

Extract of hemlock, five grains,
Liquor of potash, twenty drops,
Camphor mixture, four ounces.

Or a pill, containing one grain and a half of *opium* with five of *camphor*, may be taken at bed-time, and repeated, if necessary, in the morning. It has also been found beneficial to rub the under surface of the genital organ with an ointment composed of equal parts of fresh *belladonna* leaves (powdered) and lard. When the effects of the chordee are long in going off we must rub in a small quantity of the *camphorated mercurial ointment* every night along the surface or sides of the genital organ. When the irritation extends to the bladder and gives rise to a frequent desire of making water, with pain, a draught containing six grains of the extracts of *hyosciamus* or of *hemlock*, in four ounces of *camphor mixture*, must be taken at night; or two grains of *opium* may be taken in pill, and an ounce of *castor-oil* administered in the morning, to prevent costiveness. When the glands in the groin begin to swell and are painful, six to ten *leeches* should be applied to the painful part; the patient should endeavor to keep as quiet as possible, and should constantly apply cold *Goulard water* to the swelling, with lint covered by oiled silk. The extension of the inflammation to the testicle produces a very painful affection; the testicle swells, the skin which covers it becomes red, and a constant pain shoots up from the testicle to the groin. This complaint may often be prevented by wearing a *suspensory* bandage to support the testicle from the commencement of the gonorrhœa; but when it has seized on the part, we should at once apply ten to twenty *leeches* to the surface of the inflamed testicle, and repeat the leeches a second time if the pain continue unabated. The bowels must be freely acted on by cathartics. The testicles must be supported by a suspensory bandage or a silk handkerchief, and a lotion composed of *Goulard water*, or one ounce of spirits of wine in five ounces of water, should be constantly applied to the inflamed parts. Swelled testicle is now treated by strapping with adhesive plaster.

GLEET.

When gonorrhœa has continued for some time, and the pain has completely disappeared, the discharge gradually loses its yellow color, becomes greenish, and finally clear; the constant running of this clear discharge from the urinary passage is called a *gleet;* but any excess of diet, &c., is apt to bring back again the greenish or even yellowish running. Gleet is not attended with much personal inconvenience, and is often neglected on this account, and allowed to continue for many months or years. When it has lasted for a long time it is frequently difficult to cure it by any treatment which we may adopt.

TREATMENT OF GLEET.

Gleet is treated on two principles.

1. *Local applications* of fluids by injection, as described under treatment of gonorrhœa; and *bougies* of various sizes passed up to the bladder, one, two, or three times a week. Sometimes these bougies are smeared with *calomel ointment* or *glycerine*, and are placed in very cold water or on ice before they are applied. The use of bougies may be alternated with the injections.

2. *General tonic treatment.*—Gleety patients are often debilitated. Quinine, muriated tincture of iron, and strychnine may be used with advantage in connection with *general electrization* (if any physician near understands this method of treatment), and nourishing food.

Recently the oil of erigeron (see *Erigeron*) has been used internally in gleet with success. It has some special influence on the inflamed urethra.

Many patients who have a slight gleety discharge from the urethra are much more annoyed by it than is necessary. They become blue and hypochondriacal. They imagine that great evil is to befall. They frequently suppose that the discharge is seminal fluid, and that they will soon become impotent. Even when the physician ascertains by microscopic examination that the discharge comes entirely from the urethra, still they refuse to be comforted. All this is extreme folly. One great advantage to patients in consulting some *honest* physician when they are afflicted with maladies of the genital organs is that they are immediately reassured and informed as to the real truth in these matters. (See *Seminal Emissions.*)

The teachings of quack doctors are chargeable with a vast amount of needless distress.

GLYCERINE.

Glycerine is a neutral substance that is left when fatty acids unite with alkalies to form soaps.

Within the past few years it has been much used in medicine. It is very bland and unirritating, and also possesses some peculiarly curative effect on diseased mucous membranes. It is used for *diseases of the skin*, for rhinitis (catarrh), and for inflammations of mucous membranes in the various parts of the body.

It is used as a *vehicle* to contain other remedies. Thus we use iodine, tannin, in glycerine for inflammations of the nose and throat.

Goulard Water. (See *Lead and Opium Wash.*)

GOUT.

We shall make only two divisions of gout, the regular or acute, and the irregular or chronic gout.

REGULAR OR ACUTE GOUT.

An attack of gout is invariably preceded by certain symptoms, which, though not observed in every case, always take place in a more or less marked manner. These premonitory symptoms vary greatly in different individuals, but are in all cases connected with a deranged state of the digestive organs; the tongue is foul, or much redder than natural; there is heartburn, sometimes belching of sour fluid, and perhaps vomiting; the patient feels sleepy and uncomfortable after eating, is frequently low-spirited, and sleeps badly. The feet are sometimes very cold, at other times distressingly hot; a pricking, darting, or numb sensation is felt occasionally in the legs and feet, particularly in the foot which is about to be attacked; and some hours previous to the paroxysm there are generally flushes of heat alternating with shivering. Indeed, a long train of warning symptoms might be easily enumerated, but they are all so irregular, and vary so much in different individuals, that we see no necessity for noticing them further. It is worthy of remark, however, that every person subject to gout experiences some particular sensation or symptom which serves to announce the approach of an attack.

At length the first paroxysm declares itself, as in asthma, about two or three o'clock in the morning. The patient awakes suddenly, with a violent throbbing pain, generally at the ball of one of the great toes, though sometimes at the heel, instep, or ankle. The pain goes on increasing, accompanied with a sensation of burning heat, weight, and stiffness of the part, and severe shooting pains in the limb. This local suffering is at first attended with rigors or shivering, which is soon replaced by fever and great restlessness. In mild cases the pain after a few hours abates a little, and gentle perspiration breaks out; but in general it continues without any amelioration until about midnight, and then begins to diminish until towards two or three o'clock in the morning, when the patient falls asleep, after twenty-four hours' severe suffering. On awaking he finds the part very tender, red, shining, and swollen, with considerable distention of the veins of the foot. The following night the pain and fever are renewed, and again relieved in the morning; this goes on regularly during a longer or shorter period, each paroxysm being less severe than the preceding one, until at last the attack terminates entirely. The part remains swelled for some days afterwards, there is severe itching, and the skin falls off in scales; the patient then feels better in every respect than before the attack.

The first attacks of gout seldom continue beyond three or four days, and are confined to one foot; but when the disease has gone on for some time the inflammation, when declining in one foot, suddenly attacks the other, and frequently the fingers, wrists, or knees. Then the acute, gnawing pain, the shivering and subsequent fever, the swelling and redness of the part, and all the symptoms as above described, recommence. At the expiration of three or four days the pain is again relieved; but the attack does not end here. A similar fit supervenes, affecting the same or another joint, or perhaps several parts simultaneously, accompanied with the same series of symptoms and continuing during the same length of time. Hence, to complete an attack of gout three or four consecutive fits are required, each taking three, four, or five days to run its course. Fifteen days may be considered as the average duration of an attack of gout, but it frequently continues much longer.

The time which may elapse between the attacks is very uncertain; twelve months or even several years may intervene between the first and second attack, but the interval is often much shorter; this depends in a great measure on the constitutional tendency and manner of living of the patient.

When the disease has been confirmed, the attacks occur more frequently, are more severe, continue longer, extend to several joints, and affect to a certain extent, in some individuals, almost every joint of the body, until at last the constitution gives way and the patient is rendered miserable.

One of the most constant phenomena connected with gout is the passing of high-colored urine during the attack, frequently containing particles of sand or gravel; but when the feverish symptoms have abated the sediment acquires a white color, and resembles chalk or magnesia.

IRREGULAR OR CHRONIC GOUT.

Chronic gout is generally the consequence of several attacks of the acute form, or it may appear as a primary affection. In both cases the difference which exists between it and acute gout consists in the pain being less severe, the feverish symptoms milder or entirely absent, and the attacks of much longer duration, continuing in some cases several months, in others all the year round, with the exception of two or three of the summer months. But in general, before gout becomes chronic, several of the joints have been affected; from the feet it has passed to the ankles, fingers, wrists, knees, &c. In this state of the disease several joints are seized in succession during the same attack; but when it wanders in this manner from one part to another it rarely happens that the pain keeps up its original intensity.

The pain in chronic gout is constant, but not nearly so severe as in the acute form. At times, however, it becomes considerably increased, particularly after meals, during the early part of the night, and when the patient changes the position of the affected parts; it is also aggravated by changes of temperature and fits of anger. Under these or other circumstances the suffering occasionally becomes acute in the very extreme. Even persons otherwise robust, and possessed of the greatest fortitude, are driven almost to a state of madness by the violence of the pain. In such cases a fainting fit is not an extraordinary occurrence.

After acute gout the joints soon resume their usual strength and freedom of motion, but in the chronic form they remain stiff, swollen, and not unfrequently deformed. In some cases, especially in those who have been long subject to gout, a substance resembling soft mortar, or plaster of Paris in a half-liquid state, is deposited about the small joints; and when this matter becomes hard it is commonly called *chalk-stone*. These chalky concretions may be formed immediately under the skin or within the joints. They are often the source of great pain, sometimes cause inflammation, and the formation of matter, along with which they are occasionally discharged. Chalk-stones were discovered by Dr. Wollaston to be composed of urate of soda.

One of the most remarkable and peculiar phenomena of gout is the facility with which it moves from one part to another. After attacking several of the joints in succession it may be suddenly transferred to the stomach, bowels, brain, heart, kidneys, or in fact to any internal organ or part. This is distinguished by the term *retrocedent gout*. If gout change its seat from a joint to the stomach or any other organ during an acute paroxysm, the internal affection will also be acute; but if the gout be chronic the internal disorder will be less severe and longer continued. When gout is thus transferred, the stomach and bowels are the parts most frequently attacked; the former with pain, spasm, sickness, and vomiting; the latter, either alone or in conjunction with the stomach, with violent colic or acute inflammation. Gouty people, however, are too apt to attribute every internal disorder, whether functional or inflammatory, to the influence of gout; though it by no means follows that the numerous derangements to which they are subject are characteristic of this disease, merely because they co-exist or follow it. In fact, the translation of gout from the joints to internal parts is not nearly of such frequent occurrence as is generally supposed; and this ought always to be kept in recollection in order to avoid errors in treatment.

Causes.—That a predisposition to gout is transmitted from parents to their children is a fact not to be doubted; and when hereditary disposition exists there is every reason to believe that the disease is more ready to declare itself than under other circumstances; but the cases in which it occurs without the more powerful influence of intemperance and idleness are very rare indeed. Gouty people attribute the disease to this predisposition, as if it were the only cause; but we know that there is nothing more natural than that the son should acquire the same indolent and luxurious habits as his gouty father, and that there is nothing more likely to happen than that the influence of those habits on the system, particularly when associated with hereditary disposition, should bring on the same disease. But if the son be placed in a different position in life, if from reverse of fortune he be compelled to toil daily in order to gain a scanty maintenance, he may at least rest assured that, whatever misfortunes and sufferings he may have to labor under, gout is not likely to be one of the number.

The influence of age is more clearly shown than that of predisposition entailed on offspring. It was stated by Hippocrates, and has been remarked from his time downwards, that gout rarely if ever occurs before the age of puberty. The first attack may take place at any period of life from twenty-five to fifty; but when the predisposition is strong, and the habits of the individual intemperate, it may declare itself much earlier.

Women are most frequently attacked by gout after the entire cessation of the menstrual discharge; but at no period of life are they so subject to it as men. The late Professor Gregory stated the proportion as one to fifty in England, and one to a hundred in Scotland. This relative exemption is, no doubt, owing to their temperate habits, and the periodical discharges by which the system relieves itself.

One of the causes to which gout has been attributed by many authors, both ancient and modern, is over-indulgence in drinking wine; and there can be no doubt that this habit has a strong tendency to bring it on. Observation has also shown that the habitual use of claret, champagne, and port is more likely to produce this effect than indulgence in other wines, and malt liquor and cider more than spirits.

A patient of mine, who had suffered for many years from the so-called rheumatic gout, once told me that whenever she took "*one sip of champagne at a dinner, she felt it instantaneously in the affected joints.*"

TREATMENT OF GOUT.

Acute gout is treated by *colchicum* or *meadow-saffron.* The wine of the root may be given in doses of from *ten to twenty-five drops*, three, four, or five times a day. Colchicum should not be given in very large doses. It may produce unpleasant and serious effects.

Local applications of alkaline washes (solutions of carbonate of potash) may be made to the affected joints, or of laudanum. The joint may be wrapped in oiled silk or *spongio-piline. Cold* applications should not be used, as they may drive the disease to some important organ.

When gout attacks the stomach the horrible pain may be relieved by *hypodermic injections* (see *Hypodermic Injections*), or by chloroform or laudanum, or Hoffman's anodyne, or brandy, internally. Mustard plasters may be placed on the pit of the stomach, and the feet may be bathed in mustard water.

A change of air, a trip over the ocean, will sometimes cure an attack of gout when other remedies have failed. Patients in the North might try a trip to the Southern States.

Prevention of Gout.—The most important part of the preventive treatment is a proper regulation of the diet, which ought to consist of tender, well-boiled vegetables, stale bread, fruit, eggs, fish, and a moderate allowance of plainly dressed beef or mutton once a day. Rich and highly seasoned dishes, heavy puddings, pastry, salads, pickles, salmon, &c., are to be avoided. No general rule, however, can be laid down; the particular articles of diet must vary in different individuals, and the quantity of food to be allowed must depend in a great measure on the extent of daily exercise made use of. A spare diet should be rigidly adhered to by full-blooded persons, who have a strong hereditary disposition to the disease; but in general this is not necessary. The maxim should be, not to eat more meat or drink more wine than is really necessary; to regulate the quantity and quality of food so as not to injure the health, always keeping in recollection that people in general, and gouty people particularly, eat more than is good for them; more, in fact, than is consistent with the due performance ot all the functions of the body; that is to say, with perfect health.

The preventive agent ranking next in importance to a well-regulated diet is exercise. But exercise, in order to produce the desired effect, must be regular and sufficiently active. Walking is to be preferred, if the state of the feet will admit of it, otherwise active exercise on horseback should be employed. Much benefit may also be derived from friction of the limbs with rough towels or a flesh-brush night and morning. Flannel should be worn next the skin; cold, wet, and sudden changes of temperature are to be avoided; the feet must be carefully kept warm, particularly during the night; and the patient should retire to rest at an early hour in order to insure early rising in the morning, than which there is nothing more conducive to health.

The principles already laid down show the necessity of guarding against a change from a very active to a sedentary life, and from low to high living; indeed, the reverse of these changes, if adopted suddenly, are not without risk. In fine, all the usual rules for the preservation of health ought to be particularly attended to by gouty people. Nearly all that can be said on the subject is comprehended in the old Scotch saying, that "any man might cure himself of gout by living on a sixpence a day, and working for it."

(For Rheumatic Gout see *Rheumatism.*)

GUAIAC.

The substance called guaiac exudes from a tree, native of the West Indies, the wood of which is well known under the name of *lignum vitæ.* It is possessed of moderately stimulating and sudorific properties, and is given to promote perspiration in some forms of gout, chronic rheumatism, and in certain affections of the skin, but is rarely trusted to alone. In the West Indies it is much used in the treatment of syphilis and yaws.

The dose of gum guaiac is ten or twenty grains, mixed with a little mucilage of gum arabic, or made into pills; the *ammoniated* *tincture* may be taken in doses of from thirty drops to a drachm and a half twice or thrice a day, with yolk of egg or a little mucilage; if given by mistake in water it becomes white and thick.

GUM AMMONIAC.

Gum ammoniac is the produce of an umbelliferous plant which grows in Persia. This gum-resin is seldom used alone, but is found useful as an expectorant in the chronic cough in old persons, and in some forms of asthma. In the cough which attends hysterical, dyspeptic, and hypochondriacal affections it is said to be a serviceable remedy. Ammoniac ought not to be given in consumption, nor when inflammatory symptoms are present. Externally it is used to reduce indolent tumors.

The dose of gum ammoniac is from ten to thirty grains.

GUM ARABIC.

Gum arabic is obtained from a genus of plants called *Mimosa* or *Acacia*.

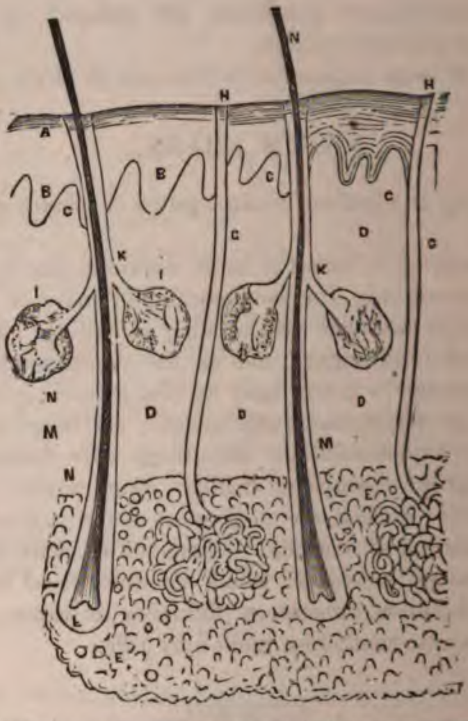
When dissolved in water it is in common use as a demulcent drink, and enters into the composition of many of the mixtures, jujube and other lozenges, used to allay coughing. It is also sometimes employed in strangury, and at the commencement of gonorrhœa. *Gum-water* is much used by the French in irritation and inflammation of the stomach and bowels; but there is no evidence to show that it possesses any advantage over linseed-tea, barley-water, and similar demulcent drinks. Gum arabic may be taken in any quantity; indeed, the negroes of some parts of Africa subsist on it in seasons of scarcity. Dissolved in twice its quantity of water it is called *mucilage*, which is much used to render oils, balsams, and resinous substances diffusible in water, and serves to give consistence to medicines made into pills.

GUM-BOIL.

A gum-boil sometimes arises from exposure to cold, but is caused in the majority of cases by the irritation of a spoiled tooth. Inflammation of the gum generally goes on to suppuration, to promote which warm fomentations and poultices are frequently applied externally, but they appear to be of very little service. The treatment consists in cutting into the abscess as soon as there is reason to suppose that the smallest quantity of matter has formed. Afterwards the mouth may be washed occasionally with an astringent lotion composed of *tincture of galls* and water, or of twenty o twenty-five grains of *sulphate of zinc* (*white vitriol*) dissolved i half a pint of *rose-water*. When the pain and inflammation hav entirely subsided the decayed tooth should be extracted or fille by the dentist.

HAIR, STRUCTURE OF.

The following cut shows the appearance of a section of the ski under the microscope:



SECTION OF THE SKIN UNDER THE MICROSCOPE, AFTER BEIGEL.

The cut represents the outlines of a vertical section through the human skin, A A being the epide adapting itself to the elevations (C C) and depressions (B B) of the sensitive layer; C C, papillæ of corium, D D; E E, fat deposited in the lower meshes of the corium; F F, globular balls of perspira apparatus; G G, tubes of the same apparatus; H H, openings of these tubes on the skin, called p I I, oil glands of the skin; K K, their openings into the sheath of the hair; L L, papillæ of the ro the hair; M M, sheath of the hair; N N, bulb and shaft of the hair.

The *skin* in which the hair grows is composed of three laye the *epidermis*, the *sensitive layer*, and the *corium*.

The skin is everywhere filled with pores. According to one of our highest authorities on this subject, there are seventy-three feet of *pores* in every square inch of skin. Through these pores the perspiration exudes.

From the same authority, as quoted by Beigel, we learn that:

" On the pulps of the fingers, where the ridges of the sensitive layer of the true skin are somewhat finer than in the palm of the hand, the number of pores on a square inch a little exceeded that of the palm; and on the heel, where the ridges are coarser, the number of pores on a square inch was 2268, and the length of tube 567 inches, or forty-seven feet. To obtain an estimate of the length of tube of the perspiratory system of the whole surface of the body, I think that 2800 might be taken as a fair average of the number of pores in the square inch, and 700, consequently, of the number of inches in length. *Now the number of square inches of surface in a man of ordinary height and bulk is* 2500 ; *the number of pores, therefore, seven millions, and the number of inches of perspiratory tube one million seven hundred and fifty thousand—that is, one hundred and forty-five thousand eight hundred and thirty-three feet, or forty-eight thousand six hundred yards, or nearly twenty-eight miles.*"

COLOR OF THE HAIR.

According to Beigel (previously quoted) the color of the hair depends on these three conditions :

1. *The color* of the cortical cells, which plays the most important part, and varies from very light yellow, through intense red and all shades of brown, to a deep, dark hue, as seen in the hair of the negro.

2. *The molecules, consisting of pigment,* diffused through the cells of the cortical substance. It is diminished in fair, and entirely absent in gray and white hair, in which the coloring matter of the cells may likewise have—though not necessarily—disappeared.

3. *The amount of air contained both in the air cavities and the medullary canal.*—It is only recently that the part of the air contained in hairs has been more carefully investigated and recognized.

HAIR AND SCALP, DISEASES OF.

I cannot attempt to give any full description of diseases of the hair. I shall endeavor only to give a few suggestions for the guidance of those who are troubled with some of the more frequent affections of the hair, such as *dandruff*, *baldness*, and premature *grayness*.

Dandruff is one of the most common and most annoying of the affections of the scalp. There are very few who are not at times more or less troubled by it.

The best way to treat this disease is:

1. To keep the scalp clean by frequently washing it. We are too much afraid of having dry hair, because fashion requires us to keep our locks in certain positions.

The heads of infants and children should be kept carefully clean. There are many people who zealously wash every other part of the body, who perhaps take daily baths, and yet never wash their heads. Is it a wonder that the skin becomes diseased and the hair falls out! Dandruff is to the scalp what scurf skin is to the body generally.

2. *Use mildly stimulating washes.*

The following preparation I have found to be very serviceable:

Bay rum,
Glycerine,
Carbonate of ammonia,
Rose-water, of each four parts;
Tincture of Spanish flies, one part.

Mix, and shake. Dilute with water as may be convenient, enough to cause only a very slight smarting sensation on the scalp, and thoroughly shampoo the head once or twice a week.

By the use of some such preparation as this the scalp may be kept quite clean and comfortable.

We should avoid using too much of alkalies on the scalp. A moderate amount of borax or ammonia is, however, beneficial, especially when combined with glycerine. Sometimes the above preparation ultimately makes the hair moist, by stimulating the secretion of lubricating oil. The temporary effect is always to remove the oil on the hair. The permanent effect is to restore the healthy action of the scalp.

BALDNESS.

This is sometimes congenital. It is certainly very often hereditary. It certainly is not a sign of debility in all, or even in the majority of cases. Some families who are quite weakly do not become bald until very advanced ages; in other families who are very strong the head becomes bald between thirty and forty. (See *Laws of Hereditary Descent.*)

There is very little to be done for *baldness.* My directions are very simple.

1. Do not keep the head too hot. *Closely fitting and heavy hats* are probably injurious to the scalp. *Over-work of the brain* induces congestion of that organ, and is probably injurious to the scalp and hair.

"In respect to the treatment of alopecia (baldness), it must be remembered that the falling off of the hair is not the disease, but the consequence of the same. Medical advice is therefore necessary, in order to investigate the nature of the individual case, and to find out the cause of the affliction. Hence it is evident that no general remedy is possible, and that no cure of baldness can be successful until the cause has been discovered and removed. If the patient be of weak constitution or ill-nourished, he must be strengthened; if some important functions, as digestion, &c., have been deranged, they must be restored to their normal action; if undue nervous activity be the cause, special attention must be directed to the nervous system, and it requires sometimes the most attentive consideration of the case, and a very rational treatment, in order to arrive at the desired end. Some time ago I had a lad, twelve years of age, under my care in the Farringdon Dispensary, who, in the course of a few weeks, had lost his hair in such a manner as to leave the scalp entirely bald. The boy was very ill-fed, his complexion pale, and his constitution weakened. After I had procured better food and administered appropriate internal remedies, the hair soon began to grow, and the head regained its normal appearance, without my having applied any local remedy in the shape of lotion, ointment, plaster, &c."

If people used less grease on their heads, and more water, and if they were more obedient to the laws of health in other respects, I believe there would be less complaints from baldness.

I am inclined to the opinion, however, that a moderate amount of pomade is not injurious, provided the head is frequently and thoroughly cleansed in the manner above described.

On this subject Beigel thus remarks:

"Concerning the management of healthy hair, the most simple means will prove the most beneficial. Cleanliness of the scalp, cutting the hair now and then, and keeping it moderately greased by some simple pure oil or pomatum, will suffice under all circumstances. Falling out of the hair or other abnormal phenomena are diseases, and must be treated as such.

"It may, perhaps, be convenient to add some prescriptions for the preparation of oils or pomatums generally in use, and (like pomatum of quinia, or of tannin and quinia) considered to act beneficially on the skin and roots of the hair.

"The best means of cleansing the scalp is a weak solution of alcohol in water, or a solution of subcarbonate of soda, distilled water, and essence of vanilla.

"The preparations called 'bandoline,' 'fixature,' &c., much used for the purpose of rendering the hair glossy and fixing the bandeaux in the required position, according to the same author, are prepared of

Gum tragacanth,
Distilled water.

To be allowed to digest for five or six hours, then strain through muslin, press, and add

Alcohol,
Rose-water.

Mucilage of cydonia and eau de Cologne are also frequently employed for a similar purpose.

PRESCRIPTIONS FOR OIL.

Take—Castor oil, 3 oz.;
Essential oil of sweet almonds,
Oil of roses, 2 drops of each;
Orange oil, 5 drops;
Lemon oil, 10 drops.

If preferred colored, this may easily be done by digesting a little alkanet-root in it for a few days.

MARROW OIL.

Take of—Clarified beef-marrow, 1½ oz.;
Oil of almonds, ¼ pt.

Melt them together and scent the mixture at will by a few drops of any essential oil, viz. bergamot, cloves, lavender, lemon, neroli, nutmeg, &c."

It should be remarked here that those who are afflicted with chronic inflammation of the middle ear, with catarrh, should be cautious about bathing their heads or letting the shower-bath fall directly on it. They should, as a rule, use tepid water.

HAIR DYES.

These are more or less injurious. They are usually composed of very poisonous substances. The substances may be absorbed and injure the system. *Sugar of lead* and *nitrate of silver* are common ingredients in our popular hair-dyes. *Lead*, *sulphur*, and *lime* also enter into the composition of these preparations. A case of direct injury to the nervous system from the use of these substances has come under my observation.

The following I copy from a foreign medical journal; it tells its own story:

"*Sample No.* 1. *Hair Restorer.*—The sample examined consisted of a colorless fluid and a grayish-yellow deposit. The deposit consisted almost entirely of sulphur, with a minute quantity of carbonate of lead. The solution contained acetate of lead and glycerine.

"In a bottle containing 10 fluid ounces, 44.8 grains of sulphur.

and lead corresponding to 21.87 grains of acetate of lead, were found."

"*Sample No.* 2. ———— *Hair Restorer.*—The bottle examined contained 8¼ fluid ounces of mixture, composed, like the last, of a colorless fluid and a yellowish gray powder; this latter consisting of sulphur, with a trace of carbonate of lead, the solution containing acetate of lead and glycerine.

"The results of an analysis of the contents of the 8¼ ounce bottle indicated 75.6 grains of sulphur, and an amount of lead corresponding to 87 grains of acetate of lead."

"*Sample No.* 3. ———— *Hair Restorer.*—Like the preparations previously noticed, this consisted of a colorless fluid and a yellowish gray deposit, and also contained the same ingredients, viz., sulphur, acetate of lead, and glycerine, the deposit in this case being pure sulphur.

"A bottle containing 8 fluid ounces furnished 31.8 grains of sulphur, and lead corresponding to 45.1 grains of acetate of lead."

"Another preparation was found to be similar to the others, the deposit containing sulphur, sulphate of calcium, and a trace of sulphate of lead; the solution containing acetate of lead, glycerine, and a trace of acetate of calcium. In distinguishing this preparation by the epithet vegetable, the maker has allowed his inventive faculty to overstep the bounds of truth, and has given moralists another instance of the common commercial practice of calling things by their wrong names.

"A bottle containing 6 fluid ounces furnished 70.2 grains of sulphur, mixed with sulphate of calcium (milk of sulphur having evidently been used in this case); also lead corresponding to 50.8 grains of lead."

The simple truth in the matter is, as Beigel remarks, "that of the two principal chemicals used for staining the hair, viz., *nitrate of silver* and *lead*, the former colors the skin as well as the hair, while the latter is poisonous, and liable to cause most painful colics, and even contractions of the limbs."

A perfectly harmless dye for the hair has not yet been discovered.

ABNORMAL GROWTH OF HAIR.

This is not a very common disease. The accompanying cuts illustrate one or two phases that this disease may assume. They are chiefly interesting as curiosities.

It is perhaps hardly fair to call this a disease, but rather a deformity. There is, as we all know, a great difference in the quantity of hair with different individuals.

(For remarks on *scald head* and other diseases of the hair, see *Skin, Diseases of.*)

ABNORMAL GROWTH OF HAIR ON THE BODY.

ABNORMAL GROWTH OF HAIR ON THE FACE AND SCALP.

HAY FEVER OR ROSE-COLD.

This is a severe form of catarrh (*rhinitis*), of a *periodic* character. Some persons are subject to it every season during haying-time. Some are attacked in June, others in July or August. It usually runs its course in a few weeks and then passes off. Some are attacked early in the season, others later.

The general symptoms of the disease are much like those of *catarrh* of the nose (rhinitis), but are of a more violent and obstinate character. (See *Catarrh.*)

For the treatment, *quinine* is strongly recommended. In connection with quinine I would suggest injections through the nasal passages of weak solutions of chlorate of potash in tepid water.

The following description, translated from a French author, and recently published in the *Boston Medical and Surgical Journal*, is of interest:

"It is certain that in some cases the odor of the hay appears to be the exciting cause of the paroxysms. The observations of Gordon and Elliotson leave no doubt as to the fact, although the latter is wisely reserved as to the determining cause of the symptoms. He gives, among others, the remarkable case of a lady patient observed by Dr. Payser.

"The father of this lady had a sudden but temporary coryza every time he crossed a grass-field in flower.

"She herself, every year, towards June, experienced a sensation of heat and fulness in the eyes, accompanied by redness and watering. To these symptoms there soon succeeded an irritation of the nasal mucous membrane and sneezing; then the inflammation spread to the throat and the trachea, with a sensation of heat and itching in the situation of these organs. At this time the dyspnœa was most painful. All these symptoms disappeared towards the middle of July. This lady had no doubt of their connection with the grass in flower. On the middle of August she could walk through the fields with impunity, whilst in June and July the neighborhood of grass would cause her the most acute suffering. If at this time she picked a handful of grass, the integuments of her hands became red and itchy; the same symptoms would appear if she employed dry hay in packing boxes. For the purpose of escaping the vicinity of hay-fields during the fatal season, she took refuge at the sea-shore in the roughest countries. Here she found relief when the wind came from the sea, but was less well when the land breezes blew. One day when walking at the foot of Harwich cliffs she was taken with a sudden and violent paroxysm, explained in the morning, when she learned that at the very hour of her walk they were mowing a small patch of grass upon the crest of the cliff.

"At another time, in the centre of a small town, at a distance from any grass, she was seized with a sudden paroxysm, and on looking out of her window saw men making a stack of hay brought from a distance. Another time a paroxysm was brought on by her children, who entered the room after having been at play in a barn filled with hay.

"I might doubt the accuracy of these facts had I not seen others which present a great analogy to them.

"Three of this lady's children, adds Elliotson, inherited this infirmity; a fourth had common asthma, with this peculiarity, that paroxysms were brought on by the odor of guinea-pigs. Many similar facts are found in the books, enough, in my mind, to prove the influence of emanations from hay in causing the development of asthmatic coryza in certain individuals.

"But although this influence is incontestable, we can see, even in the observations cited for its support, that the affection may appear without these conditions, even in the individuals most susceptible to its effects; thus proving that it is only an exciting cause. We also find, as I was just saying, analogous conditions in the etiology of common asthma. Certain odors, certain localities always, or at least during a certain period of life, provoke the paroxysms. I have come across two asthmatics in whom the odor of flax-seed meal had this effect. One of them seems to have a special susceptibility for this ordinarily inoffensive grain. It is impossible tc make a poultice in his apartments without his discovering it and being seized with an attack of asthma. There are other cases in which the odor of bean-flowers, or the odor of the cat, produces the same effect. The emanations of hay are indeed much more active than many of the substances feared by certain asthmatics.

"A farmer of Normandy has said to me quite lately that during haying-time both he and his laborers suffered from violent headaches.

"This circumstance is mentioned in a great number of observations, with all the more authority, as the authors have drawn no conclusions from the fact, and hence had no preconceived notions upon its etiological bearing.

"Periodicity is a characteristic of many arthritic affections. A spring-time periodicity is especially peculiar to them. I have often remarked that many diseases of an arthritic origin, which are recurrent or subject to periodical exacerbations, return especially at the times in which the gout of the joints most naturally shows itself. Neuralgias, headaches, affections of the joints, have exhibited this tendency; sometimes even the neuralgias have, like the gout, been marked by a nocturnal increase in intensity. Thus the characters of the original type are found in its derivatives."

GENERAL REMARKS ON HEADACHE.

Headache is a symptom of a great many and very different diseased conditions of the body.

Strictly speaking there are as many different kinds of headache as there are different diseases that may give rise to headache. As a matter of convenience, however, we only distinguish a few varieties of headache, and between these the line is not very closely drawn. Headache may come from actual diseases of the brain of various kinds; in the great majority of cases, however, it is merely symptomatic or reflex—the result of disease in the stomach, in the liver, in the womb or genital organs, or in the general nervous system, or of a poison in the blood.

It is one of the most common and most annoying of the nervous maladies of our time. It visits every family, and at one time or another attacks nearly every individual.

GENERAL TREATMENT OF HEADACHE.

1. Treat the *cause* that produces the congestion, if it can be ascertained. Treat the *rheumatism*, the *dyspepsia*, the *disease of the liver, or of the womb*. Remove the cause, and the result must then disappear.

2. Give internally *bromide of potassium* in large doses (*ten to forty grains*), one, two, or three times a day, as may be necessary. Remember always in giving this remedy that it may, in very rare cases, produce unpleasant results; may aggravate the disease, and *produce temporary insanity;* and that, like iodide of potassium, it often *produces eruptions on the skin.*

Bromide of potassium reduces the *volume of blood in the head.*

It is difficult, and oftentimes impossible, for patients to distinguish the *congestive* from the *nervous headache.* The distinction is not ordinarily observed by physicians, and only introduced here for convenience of description.

"SICK HEADACHE."

Sick headache is a form of constitutional neuralgia, at once very frequent, very distressing, and very rebellious to treatment.

The constitutional character of this affection is proved by its manifestations, its course, its causation, and its hereditary character. Like all the neuroses, it runs in families, and oftentimes skips a generation.

The nervous diathesis which in the parent appears as epilepsy, may be developed in the child as sick headache, and reappear in the grandchildren as epilepsy again.

Chorea and hysteria, neuralgia and paralysis, hypochondriasis and insanity, seem thus to be interchangeable and varying manifestations of the nervous constitution. Sick headache is *a storm* in the system, not unlike the storms that we observe in nature. Like a storm, it comes on with haziness, dulness, heaviness, at once undefinable and oppressive. Its progress is marked by derangement of all the vital forces—probably by magnetic disturbances analogons to those which occur in nature—by general agony and distress, that render exertion of brain or muscle almost impossible, and existence itself a sorrow.

Like a storm, also, sick headache seems to relieve the system by driving out the impurities, equalizing the circulation, restoring the magnetic equilibrium. Therefore it often leaves the patient brighter and happier than before. When accompanied, as it often is, by vomiting, by abstinence from food, and by rest from all exertion, sick headache appears to be as much a remedial process, and as necessary and beneficial to the system, as a thunder-storm to the atmosphere. Sick headaches also are analogous to storms in their intensity and vehemence, and in the fact that, when in full blast, measures that aim to stay their progress are often futile.

The affection is usually accompanied by a sharp or dull pain in the forehead, and especially through the left eye. The general depression that accompanies the attack seems to bear no relation to the severity of the pain, for ordinary neuralgias, even when far more severe, are not half so depressing, and do not interfere to the same extent with the processes of thought.

It is more than probable that the sympathetic or ganglionic system is chiefly at fault in sick headache, and by this theory we may explain the fact that it is brought on or aggravated by such diverse causes. The vomiting that is an accompanying symptom sometimes relieves the distress, but frequently aggravates it. The common idea that sick headache is the result of the accumulation of bile, or indeed of any local disorder of the digestive apparatus, is mostly erroneous. In the majority of cases, the vomiting is itself the *result* of the attack of headache, which in its turn is the result of some cause that has acted injuriously on the *nervous system*, such as great excitement, anxiety, prolonged abstinence from food, or some undue mental exertion. It is probable that indigestion brings on sick headache chiefly through its effects on the nervous system.

TREATMENT OF SICK HEADACHE DURING THE ATTACK.

I have myself been a frequent sufferer from this disease, and have experimented thoroughly on myself and on others with nearly all of the well-known remedies and systems of treatment. My conclusion is, that sick headache is much more relievable and curable than is commonly supposed.

The disease is a very common one. It visits nearly every household. It is, moreover, a disease that patients are usually *obliged to treat themselves.*

The plan of treatment which I propose, and which I usually find more or less successful, is as follows:

1. *Begin treatment early*, before the disease is at its height. This rule is as important in the treatment of sick headache as in the treatment of a common cold. (See *Common Cold.*) Commence

treatment as soon as you *suspect* that an attack is coming on. Some persons can foretell when they are to have an attack for several hours in advance; others have very little warning.

2. Take twenty, thirty, or forty grains of *bromide of potassium* in half a tumbler of water. If this fails, repeat the dose. This remedy is very efficacious, although it is not a specific. (See *Bromide of Potassium.*)

3. Take *one, two, or three* grains of *oxalate of cerium* dry on the tongue. It is not necessary to be particular about the dose. The finger may be moistened and dipped in the powder once or twice. This remedy, which is very little known, sometimes acts like magic. The dose may be repeated a number of times, if necessary. (See *Oxalate of Cerium.*)

4. Hypodermic injections of atropine and morphine. These should only be used as a last resort, at least by those not medically educated. They afford immediate relief. (See *Hypodermic Injections.*)

5. *Applications of ice to the back of the neck and spine.*—Pieces of ice may be folded in a towel and held firmly against the back of the neck and down the spine for ten, fifteen, or twenty minutes. Sometimes this remedy alone will relieve the pain and induce an agreeable slumber.

By one or by all of these methods sick headache can in almost all cases be relieved or cured. Emetics, purges, alkalies, opium internally, and the other remedies that are so much used for this disease, are so uncertain as well as disagreeable that I cannot recommend them.

Patients are frequently so disappointed by their failures in the use of these remedies, that they become discouraged and try nothing whatever.

During the intervals, we should strengthen the system by *avoiding purgative medicines* and using tonics and stimulants.

(For particulars see *Nervous Diseases, Treatment of.*)

NERVOUS HEADACHE.

This variety of headache occurs most frequently in females, more especially in those who are hysterical, and in hypochondriacal persons. It may arise from various causes, such as anxiety and trouble of mind acting on those who lead a sedentary life; intemperance in eating and drinking; not eating a sufficient quantity of food, or living on diet of bad quality; excess in venery, long watching, suppression of habitual discharges; *malaria*, or the effluvia from decaying vegetable matter. It may also be caused by a decayed tooth, and sometimes appears to be hereditary.

Nervous headache generally commences suddenly. It may attack one of the eyebrows, the temple, or the orbit; or one half of the head may be affected. The pain is dull, lancinating, or throbbing, sometimes exceedingly acute, and aggravated by noise or a strong light. There are no feverish symptoms, nor is the temperature of the head greater than natural. Some patients are restless and irritable; others are languid, and almost constantly yawning.

This affection, like ague, is often intermittent, and may come on daily, every other day, once a week, or monthly; but in the majority of cases the attacks recur at irregular intervals. The pain continues three or four hours a day, or even considerably longer; but in general it goes off during the night.

TREATMENT OF NERVOUS HEADACHE.

1. *Treat the cause*, treat the *general nervous debility* of which the headache is merely a symptom. Nervous headache, like sick headache, with which it is sometimes confounded, and with which it may be associated, is a *nervous disease*, and should be treated accordingly. The patients who suffer from it are usually more or less debilitated. They need tonics. They should be treated by *quinine*, pyrophosphate of iron, strychnine, phosphoric acid, arsenic, cod-liver oil, general electrization, plenty of beef and mutton, outdoor air and sunlight, and abundance of sleep.

2. Relieve the pain by hypodermic injections, by oxalate of cerium (one, two, or three grains at a dose), or by bromide of potassium in doses of twenty or thirty grains. The oxalate of cerium is a remedy that is used far too little for headache.

GENERAL REMARKS ON DISEASES OF THE HEART.

1. There are two classes of diseases of the heart: *organic and functional. Organic* diseases are those which are connected with *actual morbid changes* in the heart. Among these we may mention *enlargement, dilatation, aneurism, inflammation of the lining membrane, inflammation of the covering, disease of the valves, fatty degeneration, angina pectoris or breast-pang.*

Functional disease of the heart is disturbance in its action, caused by sympathy of reflex action. Between these two conditions—functional and organic—there is a very wide gulf. The distinction between these is a distinction between a grave disease and one of a trifling character; oftentimes a distinction between death and life.

And yet the general symptoms of organic and functional disease are oftentimes quite similar.

Palpitation, uneasiness in the region of the heart, and even difficulty of running and climbing, as well as actual pain in or near the heart--all these unpleasant symptoms are common to both organic and functional diseases of the heart.

Those who are afflicted with these general symptoms, and who are annoyed and worried by them, ought as soon as possible to have the question definitely *settled*. Now there is only one way in which this question can be settled; and that is, by getting the *opinion of some skilful and honorable physician, who is practised in the arts of auscultation and percussion*, or what is commonly known as "sounding the chest." (See *Auscultation* and *Percussion*.)

The most skilful physicians in the world cannot tell whether a patient is suffering from organic or functional disease by the patient's story alone. The last appeal must always be to *auscultation* and *percussion*. The sphygmograph also helps to study diseases of the heart. (See *Sphygmograph*.)

Some persons fear to consult a physician lest he may tell them unwelcome truths. This feeling is unmanly. The true way is to look our difficulties *squarely in the face*. Anything is preferable to suspense. Better to know our danger, and to face it. The man who knows that he has some incurable organic disease of the heart is usually much happier than he who *fears* and suspects he may have, yet dares not consult a physician and have his doubts solved.

But as a matter of fact, the great majority of those who fear or suspect *that they have organic disease are really suffering only from sympathetic or functional disturbances*, coming from dyspepsia, anæmia, or general nervous debility. There are thousands in our country who go all their lives fearing lest they may die at any moment from some imagined disease of the heart, who, if they consulted some good physician, would find out *that really their symptoms meant nothing more than dyspepsia or general debility.*

On this subject the following remarks of Prof. Austin Flint are worthy of attentive consideration:

"It is extremely desirable, in view of the comfort and welfare of the patient, to determine with positiveness, in cases of functional disorder, that structural lesions do not exist. Several points connected with the history and symptoms have a bearing on the diagnosis. The occurrence of the disturbance in paroxysms, the action at other times being regular; the paroxysms occurring at night rather than in the daytime, and frequently not being occasioned by any obvious cause, such as muscular exertion or mental excitement;

the ability of the patient to take active exercise without palpitation, or difficulty of breathing when not suffering from the disorder, and the intensity of mental anxiety and apprehension, are points which render it probable that the difficulty is purely functional. These points, however, are not conclusive. A positive diagnosis is to be based on the exclusion of lesions of structure, by the absence of the physical signs of the latter. If, on a careful examination of the chest, the heart be not found to be enlarged; if there be no murmur present, or if an existing murmur be inorganic, and the heart-sounds be normal, the affection may be confidently pronounced functional. Without the negative proof afforded by physical exploration, the mind of the practitioner must be in doubt as to the diagnosis. If he give a decided opinion, it is a guess which may prove to be either right or wrong. If he avoid giving a decided opinion, the inference which the patient usually draws is that organic disease exists, and the physician is reluctant to tell him the truth. I could cite from the cases which have come under my observation not a few in which patients were for many years rendered unhappy, and deterred from engaging in the active duties of life, by either an erroneous medical opinion that they had organic disease of heart, or by a fixed belief that such was the fact, based on the indecision of their physicians."

Organic diseases, even, are not always such terrible maladies as many suppose. They are not always speedily fatal. They are not always fatal at all. A patient with organic disease of the heart may live for years, and yet finally die of some other disease.

TREATMENT OF ORGANIC DISEASES OF HEART.

Tonics, quiet, easy activity, nourishing food, abstinence from excitement, and from all sudden, violent, spasmodic exertion of mind or body—this is about all that we can do.

Other medicine, except that which is given for the relief of pain, is valueless.

Acute inflammation around the heart (pericarditis) and within the heart (endocarditis), occurring in rheumatic fever, are to be treated by the remedies that are given for rheumatism. (See *Rheumatism.*)

INFLAMMATION OF THE HEART.

In very many cases inflammation of the heart is not attended with positive symptoms, but we may suspect its existence if the patient, after having suffered under rheumatic fever, complains of a load or fulness about the heart, with dull pain, restlessness, anxiety, and occasional palpitation.

NERVOUS DISEASE OF THE HEART.

The heart is very subject to disturbance of its action, not depending on organic disease, but on certain impressions conveyed to it from distant parts through the nervous system. The only symptom of this nervous disturbance to which we need allude is *palpitation.* It is of great importance to distinguish *nervous palpitations* of the heart from palpitations which depend on derangements of the heart's structure (*organic*); because the former, although they excite considerable anxiety and alarm in the patient's mind, are completely under the control of medical treatment. *Nervous* palpitation may be distinguished from *organic* palpitation by the following circumstances. Nervous palpitation is apt to come on more particularly when the patient is lying awake in bed, at the beginning of the night. It is not rendered worse by moderate exercise, but is rather relieved by it; whereas *organic* palpitation is necessarily increased by any corporeal exertion, however slight. Nervous palpitation is often accompanied by other nervous symptoms, and whenever the latter are increased the palpitation becomes increased with them. Finally, in nervous palpitation there is generally some *intermission*—that is to say, the patient is free from it at certain times, during which the pulse and heart beat quite naturally; while in *organic* palpitation there is hardly ever any cessation of this distressing symptom, because the diseased structure upon which it depends is *constantly* irritating the heart, and compelling it to act with violence.

Nervous palpitation commonly occurs in men of nervous temperament, who have been rendered more irritable by the too free use of ardent spirits, by excessive venery, long study, or the depressing passions. It often attacks persons who are much addicted to smoking tobacco, or have frequently suffered from indigestion. In women this affection generally depends on green-sickness (*chlorosis*), or hysteria; it may also be connected with excessive loss of blood.

Treatment.—As nervous palpitation is merely a symptom of some other disorder, its treatment must be subordinate to that of the disease upon which it depends; to prevent repetition, therefore, I would refer my readers to the articles on dyspepsia, green-sickness, hysterics, and nervous disorders, &c. The first point in the treatment will naturally be to remove, if possible, the cause of the symptom. Excesses of all kinds must be avoided; the patient should take gentle exercise in the open air, and regulate his diet with attention. When the palpitation seems to depend on a very irritable and nervous temperament, change of air, sea-bathing, and the enjoyment of rational amusements will have much effect in quieting the heart's action; after which a course of mineral waters may be tried with advantage. When the palpitation is very distressing at night, it may be necessary to give some medicine which will quiet the patient, and afford him relief until the other remedies that we are employing have time to produce some effect. (See *Nervous Diseases.*)

HEARTBURN, OR WATER-BRASH.

Heartburn, though not attended with danger, is often very difficult of cure. It occurs most frequently among poor people, is seldom met with before the age of puberty, and not often in old people. Females are more subject to it than males, and some women suffer from it only during pregnancy. It is often caused by eating fat or oily substances, cheese, or some particular article of food which disagrees with the stomach, and in general is merely a symptom of indigestion. It may arise from exposure to cold, sitting with wet feet, or from any sudden mental emotion; and in some individuals it cannot be traced to any cause.

The symptoms are a burning sensation, attended with a feeling of constriction at the stomach, which, after continuing some time, is followed by frequent belching of a thin fluid, sometimes exceedingly sour, at other times insipid. The attack may come on at any period of the day, and may continue during several hours. In some people it comes on daily for weeks or months; in others it occurs only occasionally, in consequence of indulging in some article of diet difficult of digestion. Heartburn sometimes accompanies organic disease of the stomach or liver.

Treatment.—When heartburn comes on only occasionally, it may be relieved by means of a teaspoonful of *carbonate of soda*, or the same quantity of *magnesia*, taken in a little water; but when it recurs frequently and becomes very troublesome, more active treatment should be resorted to. In some cases, however, it is protracted through a period of many months, uninfluenced by any medical treatment which may be adopted.

Water-brash is one of the symptoms of dyspepsia. In order to treat it successfully we must treat the dyspepsia that causes it. (See *Dyspepsia.*)

As a means of temporary relief when the attack comes on, we may use *creasote* (one or two drops in water, well shaken), or *oxalate of cerium* (one, two, or three grains dry on the tongue), or by *sul-*

phite of soda or *subnitrate of bismuth.* Some one of these four remedies will usually afford relief.

HECTIC FEVER.

In this species of fever the patient is attacked daily, between five and six o'clock in the afternoon, with rigors or shivering, which continues from a quarter of an hour to an hour, and is followed by quick pulse, hot skin, thirst, and restlessness. Delirium is not a symptom of this affection, and headache only occasionally occurs. Profuse sweating breaks out about ten or eleven o'clock, which relieves the patient, who then falls asleep, and on awaking, about five or six in the morning, finds himself bathed in perspiration. There is also another attack about noon, which is slight, and sometimes not attended with shivering. Indeed, hectic fever, when it has continued for some time and is completely formed, never ceases entirely, inasmuch as the pulse beats at least ten strokes in a minute more than it would do in a state of health; and in this respect differs from ague, in which there is a complete intermission.

The pulse is always quick, varying from a hundred to a hundred and twenty, and sometimes it reaches a hundred and forty. "Almost from the first appearance of the hectic, the urine is high-colored, and deposits a copious branny red sediment, which hardly ever falls close to the bottom of the vessel." The appetite is at first very little or not at all impaired, but gradually gives way as the patient's strength diminishes; the tongue is red and clean; the face is pale in the morning, but towards evening, when the feverish symptoms commence, a circumscribed redness appears on the cheeks, called *hectic flush;* and the white of the eyes has a delicate pearly tint.

The patient becomes weak and emaciated, the cheeks are hollow and sunken; the face is long and thin, and the eyes appear sunk in their orbits. Purging comes on at last; and this, with the excessive perspiration during the night, rapidly reduces the patient's strength, and he dies completely exhausted. (See *Pulmonary Consumption.*)

Hectic fever may arise from irritation or slow inflammation of any part or structure of the body, associated with debility, or, as it is, sometimes termed, a broken-down constitution; or it may be caused by the fluids of the body becoming corrupted in consequence of the absorption of morbid matter (pus).

Treatment.—Hectic fever being generally, if not invariably, symptomatic of some other disorder, the means of cure must, of course, have direct reference to the morbid state of the organ or part with which the fever is associated. I must therefore refer the reader to treatment directed for the diseases on which it depends.

HEMLOCK.

This is a well-known indigenous plant, found growing in ditches, on the banks of rivers, and in waste places. It flowers in July and early in August, and is distinguished from plants which resemble it in appearance by the spotted stem.

The extract of hemlock, taken in moderate doses, acts on the system in a similar manner to henbane and aconite; and, like those remedies, is also narcotic and sedative, without producing any stimulant effect.

The diseases in which it is principally employed are cancer, syphilis, scrofula, rheumatism, and inflammatory or spasmodic affections of the urinary organs. It has also an excellent effect in allaying the cough at the commencement of pulmonary consumption.

HENBANE. (*Hyosciamus.*)

All parts of this plant are poisonous, and accidents have frequently occurred from mistaking its root for that of parsnip, to which it has a strong resemblance.

Great advantage is to be derived from it, as a narcotic, in cancer and other painful disorders. Its value as a narcotic is now well established, and next to opium it is considered the most useful remedy of this class. Indeed, in many cases it has a great advantage over opium, inasmuch as it possesses no stimulating principle; or, in other words, is directly sedative and narcotic. Hence in all inflammatory affections, where it is found necessary to administer an anodyne or soporific, this remedy will have the effect of tranquillizing the patient, without producing the least excitement; whereas opium, on the contrary, from its stimulating action, would tend to increase the restlessness and aggravate the inflammation. Henbane has also the advantage of being divested of the constipating property which opium possesses, and has a tendency rather to open the bowels than otherwise. It seldom produces headache, which opium very frequently does.

We have already had occasion to mention the benefit to be derived from this remedy in relieving indigestion arising from irritability or functional derangement of the stomach.

A poultice made with the fresh leaves of henbane, or a watery solution of the extract, is often very serviceable in allaying the pain of irritable ulcers, or of scrofulous and cancerous sores.

The dose of the extract, in chronic disorders, should not be less at first than two grains three times a day, which may be gradually increased to five or six grains. When intended as a soporific in acute affections, the dose may be from five to ten grains at bed-time. The dose of the tincture is from twenty drops to a drachm. The effects of an over-dose of henbane are similar to those produced by aconite. It ought to be remarked that the extracts of henbane, aconite, and hemlock, commonly found in the shops, are often inert, and may be taken in almost any quantity; hence many practitioners prefer the tinctures of these plants, as preparations more to be depended upon.

HICCUP.

This affection usually arises from eating a too full meal or highly-seasoned food, drinking cold fluids, wind, acidity, and similar causes, particularly when the stomach is predisposed to it from debility. When arising from simple causes of this description, it is of little consequence, and seldom continues long; but when it comes on in a far advanced stage of fevers and internal inflammatory diseases, a fatal termination may soon be expected.

Treatment.—In ordinary cases hiccup ceases of its own accord, or may easily be checked by drinking a little cold water; by a sudden excitement of some degree of surprise, fear, or any other strong mental emotion; by swallowing a small quantity of vinegar, lemon-juice, or any other strong acid; and when it occurs after a full meal, everybody knows that a little brandy generally puts a stop to it.

When hiccup is symptomatic, the treatment must depend entirely on the nature of the disease under which the patient is laboring.

Opium, *henbane*, and similar narcotic medicines are generally administered to palliate the distressing hiccup which so frequently comes on when fevers and inflammatory diseases are about to terminate fatally.

HIP-DISEASE.

This terrible and familiar malady, which I need not here describe, is now treated much more successfully than formerly. The principle of treatment, as originally proposed by Dr. H. G. Davis, is by extension of the limb, thus relieving the pressure in the joint. Apparatus has been devised to carry out this principle most successfully. The treatment requires time, patience, and skill on the part both of the physician and of the friends of the patient.

In connection with this mechanical treatment, physicians also use internal tonics and nourishing food.

HOFFMAN'S ANODYNE.

This remedy is now much used. It consists of *ether, alcohol, and ethereal oil.* It is used in hysteria, and in nervousness generally. It has a calming influence in sleeplessness. It is therefore often used in fevers. The dose is one or two teaspoonfuls.

HOOPING-COUGH OR CHIN-COUGH.

This disease sometimes attacks children suddenly, and without giving any warning; but it generally happens that the child suffers under common cough for a week or two before the convulsive fits of coughing begin to show themselves. The first circumstance noticed about the child is, that the fit of coughing is more protracted than it was wont to be; there is a kind of hitch in the cough, which is peculiar, and this soon passes into the regular fit of hooping-cough. The fits of coughing succeed each other more or less rapidly, and are continued for a longer or shorter time, according to the severity of the disease, until they terminate in vomiting, or the spitting up of a thick frothy mucus from the lungs. When the convulsive efforts during a fit of hooping-cough are mild, the child suffers but little from the attack, and soon returns to his ordinary amusements; but if the fit be severe, the blood is often driven to the head with such violence that it rushes from the nose or ears, or renders the eyes completely blood-shot, from rupture of small vessels in the white of the eye; these circumstances should not cause alarm, for they are not attended with any immediate danger. The number of fits is extremely variable in different cases: sometimes the child will have only three or four during the day; at other times they come on as often as every quarter of an hour, and are particularly annoying during the night. The convulsive coughing may last for three or four weeks, or even longer, when it begins to decline; the fit gets less violent; the mucus is spit up from the lungs in greater quantity, and the disease gradually wears itself out in five or six weeks.

Such is whooping-cough in its simple and mild form; but in many cases the disease, either from its violence or from certain tendencies of the patient to disease of the head or chest, becomes attended with very great danger to life. The danger is, in general, proportioned to the tender age of the infant, its constitutional powers, and the organ which may be attacked during the course of hooping-cough. Thus infants are more liable to be cut off by this disease than children; weakly children run greater risks than those who are strong; and much greater danger is to be apprehended when the head is attacked than when the lungs only become involved in the consequences of the disease.

TREATMENT OF HOOPING-COUGH.

1. *Tonics to sustain and strengthen the system.*—We may give the child pyrophosphate of iron, in combination with quinine and strychnine (Wyeth's, or some similar preparation), or *cod-liver oil*, with nourishing food. (See article on *Food.*)

2. *Expectorants and other remedies* to relieve the distress and coughing. The profession at the present time have very little faith in the so-called expectorant remedies, yet they are sometimes useful. We may give any of the simple "cough mixtures." There is much less difference between them than is commonly supposed. Thus,

Syrup of ipecac,
Syrup of squills, equal parts, in teaspoonful doses,

have been given. Recently *bromide of ammonium* has been used for hooping-cough, in doses of from 3 to 10 grains.

The patient should only be kept in the house during the first few days.

It should ever be remembered that the disease is contagious.

HOPE'S MIXTURE.

The prescription for this familiar remedy is as follows:

Nitric acid, one drachm,
Laudanum, forty drops,
Camphor water, eight ounces.

The dose is a tablespoonful.

This remedy is much used in dysentery and diarrhœa.

HORSE-RADISH.

This root is familiar to every household. It is used in scurvy with some success. It has been used in dropsy as a diuretic. It is sometimes applied to the soles of the feet, mixed with mustard, as a revulsive. The juice mixed with vinegar has been recommended to remove freckles and tan.

The dose when given internally is from *half a teaspoonful to two, three, or four teaspoonfuls.* When used as a diuretic it is given in the form of an infusion, with mustard seed. Of this infusion the dose is *two fluid ounces.*

Hydropathy. (See *Water Cure.*)

HYDROPHOBIA.

Hydrophobia arises from a morbid poison introduced into the system by the bite of a rabid animal. The animals that most frequently communicate this disease are the dog, cat, fox, and wolf; but whether it originates spontaneously in those animals, or is always transmitted from one to another, is unknown. Hydrophobia is always communicated through the medium of the saliva; but it does not appear that this is capable of producing the disease without a wound having been inflicted, or the skin abraded. Some cases, however, are on record which would lead us to believe that the poison may find its way into the system through the mucous membrane of the lips, without abrasion of surface. The great majority of people bitten by mad dogs are not attacked by hydrophobia; indeed, Dr. Hamilton is of opinion that at an average *not more than one person out of ten of those bitten* becomes affected with the disease, and this may be in a great measure accounted for by the saliva being wiped from the teeth in passing through the clothes; hence the disease occurs most frequently from wounds inflicted on the face and hands.

The length of time which may elapse from the date of the bite of a rabid animal to the commencement of hydrophobia is very uncertain, but in general it declares itself after thirty or forty days; though the poison has been known to remain in the system in a latent state during eighteen months, and even longer. The bitten part heals in the course of a few days, like any other simple wound; but when the disease commences the cicatrix or scar becomes painful, red or livid, and swollen; in some cases it re-opens and discharges a thin, reddish-colored fluid. This, however, is not always the case; symptoms of hydrophobia may commence without the part presenting the slightest change in appearance, or being in the least degree painful. The disease is ushered in by slight shivering, headache, general uneasiness, and loss of appetite; by the sleep being disturbed by frightful dreams, and by extreme restlessness, agitation, and other symptoms of an excited or altered state of the nervous system; at length the patient accidentally discovers that the sight of water or any shining substance distresses him, and on attempting to drink he is suddenly seized with a general and involuntary shivering. The circumstance of the bite is now brought to his recollection, associated with the idea of hydrophobia, which strikes him with horror; a distressing sensation of heat and constriction at the throat is soon experienced, attended with urgent thirst; he appears exceedingly anxious and alarmed; the throat is frequently seized with violent spasms threatening immediate suffocation, and the whole body is agitated. The spasms, after some time, extend to other parts of the body, and the fits become more violent and occur more frequently: The saliva increases in quantity, becomes viscid, and is sometimes suddenly thrown out from the mouth. Thick mucus also collects in the throat and air-passages, and in attempting to bring it up harsh sounds are uttered, which have been supposed to resemble the peculiar growling of a dog in a similar state. The breathing is oppressed from slight causes, such as the motion of the air caused by opening a door; the slightest noise, and the sight or even the sound of water greatly increase the suffering. The miserable patient, however, cannot refrain from attempting to quench the urgent thirst which continually torments him; he musters resolution, and with a determined effort raises the water suddenly to his mouth; but before he can drink, is seized with a violent spasmodic fit, and the vessel is dashed from his lips; thus, like another Tantalus, with the water within his reach, he is doomed to suffer from the most intolerable thirst.

Feverish symptoms are always present from the time that the disease is fairly constituted; and frequent bilious vomiting, with much difficulty of breathing, adds greatly to the patient's distress; the feeling of debility, also, which has been complained of from the commencement, is much increased towards the termination of the disease. Delirium seldom occurs, but there is great irritability both of body and mind; while anxiety, distress, and occasionally fury are strongly depicted in the countenance. Sometimes, when in a fit of passion, the patient will even attempt to bite or spit at those near him, but he appears to be perfectly conscious of what he has done, and as soon as the paroxysm is over is ready to apologize for his conduct. In some cases though the pulse is very quick, yet the skin remains cool; and though blood has frequently been drawn from the arm, it has not in any case presented the buff-colored crust indicative of inflammation.

The unfortunate sufferer is at last either carried off by a convulsive fit, or is worn out by repeated paroxysms, and sinks completely exhausted. The duration of the disease varies from thirty hours to five or six days. The average period is two days.

Treatment.—The real nature of hydrophobia is totally unknown, and we are equally ignorant of any method of treatment from which the least chance of success might be expected. Blood-letting, mercury, tartar-emetic, opium, arsenic, ammonia, tobacco, and a variety of other means, have been tried in vain; in fact, there is not a well-authenticated case on record of any one having recovered from this disease.

Opium, in large doses, is the only remedy that has been found to produce any very decided effect in alleviating the terrible suffering which the miserable patient is destined to undergo.

Various plans have been adopted to prevent the saliva of a rabid animal from acting on the system, but the one on which the greatest reliance ought to be placed is to cut out the bitten part as soon as possible after the injury has been inflicted; this, though a harsh means, is the most effectual hitherto tried; but in order to insure success the operation must be effectually performed by the removal of every part which the dog's teeth may have touched. If any delay be likely to occur before the part can be removed, the individual should suck the saliva from the wound (if it has been inflicted on a part which renders this step practicable), and then immediately spit out the fluid he has withdrawn and carefully wash his mouth. This simple method of preventing the absorption of the morbid saliva naturally occurs to every one; a mother never hesitates to put it in practice when her child is the sufferer, and many lives have been saved in consequence. We do not believe that any risk is incurred from adopting this measure, provided the mouth be repeatedly and carefully washed; and the best thing for this purpose is *a saturated solution of alum;* or salt and water may be used if alum be not at hand. The wound should also be well washed with the solution of alum, which may have the effect of preventing the poisonous saliva from contaminating the system, since we know that it possesses the property of destroying all morbid animal secretions.

Another simple mode of removing the poisonous saliva, is by cupping, by means of a common wine-glass. This is a very easy process; in order to exhaust the air, a piece of paper, moistened with spirit, and then lighted, is to be put into the glass, which is to be immediately applied over the part. These means, however, are not intended to exclude the use of the knife or burning the part with caustic, and therefore surgical assistance should be procured as soon as possible.

As we cannot cure the unfortunate hydrophobic patient, we should do the next best thing, and relieve his horrible agonies.

This we can do—

1. By inhalations of æther or chloroform.
2. By hypodermic injections of morphine or atropine (see *Hypodermic Injections*), or by large doses of opium internally.

In concluding this subject it may not be considered unnecessary to give a short description of the appearance which a dog presents when in a rabid state. He at first appears dull and sullen, avoids the light, prefers solitude, and has an aversion to food; he snarls at the sight of a stranger, and may endeavor to bite him. He recognizes his master, and fawns as usual on those whom he knows, but is peevish, irritable, and apt to snap or bite suddenly without any provocation. After two or three days, if not confined, he quits his master's house, and runs along panting, with the tongue hanging from his mouth. His ears and tail droop, he appears much dejected, and his eyes are red and watery. He stops occasionally and gnaws at stones, bits of wood, etc., and attempts to bite every person he meets, but does not go out of his way to attack any one. He does not bark, but makes a peculiar growling noise, almost amounting to howling. Foam appears at his mouth, he is seized from time to time with sudden fits of fury, and bites every animal within his reach, particularly his own species. Two or three days after leaving home he is observed to be palsied behind, and to carry his head near to the ground; he becomes at last completely exhausted, and dies.

(For cut representing a mad dog, see *Poisonous Bites.*)

Hydrophobia is not peculiar to any country. It is found in Europe, America, and Asia. It is found in all climates—amid the cold of the north and the heat of the tropics. It prevails at all seasons of the year. The *popular idea that it is more frequent in the heat of summer and in dog-days, is erroneous.* It has been shown that it occurs with nearly equal frequency in winter, spring, summer, and autumn.

HYPOCHONDRIA, VAPORS, OR LOW SPIRITS.

A person affected with this singular disorder is said to be hipped. It presents itself under such a variety of forms, and the symptoms vary so much in different individuals, that many pages might be filled in attempting to describe it. The opinions of physicians also differ widely with regard to the source and true nature of hypochondria.

A hypochondriacal patient often says that he is tired of life, and wishes that death would come to relieve him from his suffering; and yet his conduct shows how very desirous he is of living, and how much he dreads death. He consults every medical man of his neighborhood, and is perhaps in communication with several of them at the same time; but not believing that they pay sufficient attention to the Protean forms which his disorder assumes, he never follows out the treatment prescribed by any of them. He reads every medical book which comes in his way, and leaves no description of fashionable quackery untried. He has recourse to *animal magnetism*, and as long as he is impressed with the idea that it will be the means of cure, he fancies that it does him good; but getting tired of this, he consults a variety of schools, and successively abandons them. A variety of empiric remedies are resorted to; but, instead of finding a specific for his numerous ailments, his digestive organs become materially affected from the quantity of medicine he has taken. The healthy appearance which he has probably hitherto retained now begins to leave him, and the consequences might soon be of a serious nature, unless he sees the necessity of following the advice of the celebrated Italian physician Baglivi. "Although at first sight," he says, "hypochondriasis may appear a destructive and incurable disease, yet the patients may generally be very easily cured, not by taking great quantities of medicine, but by the cheerful discourse of friends, the innocent pleasures of a country life, frequent exercise on horseback, and by following the mode of living pointed out by a wise physician."

TREATMENT OF HYPOCHONDRIA.

Concerning hypochondria, these facts are worthy of consideration:

1. It is probably a symptom of some disorder of the central nervous system or of the sympathetic nerve. It is frequently the premonition of actual insanity.

2. It may be brought on by any cause that injures the nervous system.

The persons most subject to this disease are those *who, after working and worrying with their brains too hard and too long in the pursuit of wealth, suddenly retire and do nothing.*

3. It is really a disease—is to be treated as a disease, and is as curable and as relievable as the majority of nervous diseases.

(For treatment see *Treatment of Nervous Diseases.*)

The disease is undoubtedly increasing in frequency.

HYPODERMIC OR SUBCUTANEOUS INJECTIONS.

The accompanying cut represents a syringe that is now much used for the purpose of injecting remedies beneath the skin. This method of treating neuralgia and a number of other diseases is becoming very popular with the profession.

When morphine and atropine are thus injected beneath the skin, pain is usually relieved almost instantly.

There is no remedy to be compared with this for the temporary relief of pain. When frequently repeated, its effects are sometimes permanent.

Fatal accidents have sometimes happened from the use of hypodermic injections, but when *cautiously* and *skilfully* used they are harmless. As a general rule they should be employed only by physicians, but nurses and those who are not physicians can be instructed in the use of them in cases when the physician cannot remain in constant attendance. Sea captains should understand the use of the hypodermic syringe. The syringes that are mostly used are of glass and hold about half a fluid drachm, and are graduated for drops. "In operating, draw the skin tense with the forefinger and thumb of the left hand, and pass the point of the tube quickly and steadily through it. Then push in, not rapidly, the desired amount of the fluid." Avoid the veins. One of the best places for injection is the upper and outer surface of the arm.

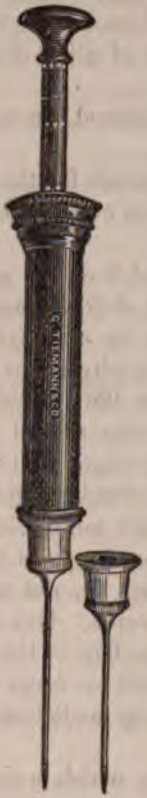
Great caution should be used not to inject *too large a quantity.*

On the advantages of this method of using medicines, Dr. C. E. Brown-Séquard thus remarks:

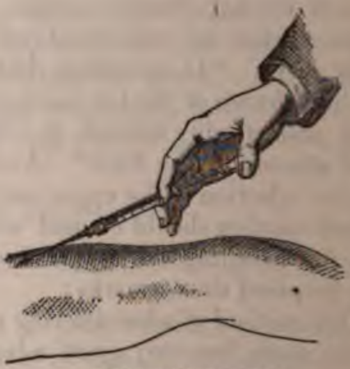
"This method of administering remedies, which is now very extensively used, has very great advantages over most of the other methods. I will only point out a few of these advantages. 1. Rapidity of effect. 2. Certainty that the remedy will not run the risk of being decomposed by food, secretions, or fæces, as may be the case in the digestive tube. 3. Possibility of introducing safely into the circulatory system a much larger dose than by other methods. This last advantage is the principal one in the use of the hypodermic method against neuralgia. This explains how neuralgic patients who had taken apparently large doses of narcotics by the mouth, with no permanent and even no temporary marked benefit, are sometimes completely cured by one or by a few hypodermic injections of narcotics." Although *narcotics* have been chiefly used hypodermically, yet other remedies, such as strychnine, quinine, have been used in the same way.

DOSES OF MEDICINES FOR HYPODERMIC INJECTIONS.

Sulphate of morphia, one eighth to one quarter of a grain.
Sulphate of atropia, one hundredth to one fiftieth of a grain.



HYPODERMIC SYRINGE.



HYPODERMIC INJECTION.

As a rule, about *one third* the ordinary dose of any medicine is used for hypodermic purposes. Morphine and atropine may be combined.

HYSTERICS.

Hysteria has in many respects a close resemblance to epilepsy, and is supposed by some physicians to be a species of that disease. Several well-marked symptoms, however, distinguish these disorders from each other. In hysteria the face is not nearly so much distorted, nor does it ever acquire a livid color, as in epilepsy; and in the former affection the patient generally hears what is said to her and seldom becomes entirely insensible; froth does not appear at the mouth, there is no grinding of the teeth, nor is the tongue ever injured; the breathing is not stertorous or snoring, and the hands remain open.

A paroxysm or fit of hysteria is generally announced by headache, restlessness, cramps, coldness of the feet, yawning, and sometimes by immoderate fits of laughing, or crying and laughter alternately. The patient experiences a peculiar sensation, as if a ball were moving about with a rumbling noise in the belly. This, after some time rises, to the stomach, and thence to the throat, where it fixes itself, causing a most intolerable feeling of choking or strangulation. The breathing now becomes hurried, the heart palpitates; giddiness, sickness at stomach, and dimness of sight follow. The patient then falls down, seized with convulsions; she screams, perhaps tears her hair, and beats her breast; her body is writhed to and fro, and the limbs assume a variety of postures. The convulsive movements are not constant; a succession of fits take place, with longer or shorter intervals between them. Sometimes the urine is discharged involuntarily; and during the absence of the convulsions the patient laughs wildly, cries or screams; and sometimes a distressing hiccup comes on. The abdominal muscles may be irregularly contracted, or the belly may be drawn inwards towards the spine, or is tense, and distended with air; the veins of the neck are greatly distended, and the carotid arteries beat with unusual violence. In delicate females the face is pale and flushed alternately; in the more robust it is flushed, and appears fuller than usual. The patient having remained in this state during a longer or shorter period, often for twenty-four hours, and sometimes considerably longer, at length begins to recover gradually. The spasms abate; wind is freely discharged from the stomach; there is frequent sighing or sobbing; she complains of severe headache, with a feeling of soreness over the whole body and limbs, and lies in a languid and listless state for some time before she is able to rise. The recovery in some cases is sudden, and accompanied with a loud fit of laughing or immoderate crying; and there is often a copious discharge of pale urine.

This disease imitates so many others, and assumes such a variety of symptoms, that a concise description fails in conveying an adequate idea of it; but we do not see any necessity for giving a minute account of all its various forms and relations, because, however formidable in appearance, it is never attended with danger.

A point, however, of considerable importance with regard to hysteria is the difficulty of distinguishing it from other diseases;

indeed, it has such a near resemblance in many respects to hypochondria in males, that medical men are often embarrassed by the variety of symptoms which occur in hysterical females; and in many cases considerable experience and judgment are required in order to be able to discriminate between functional or even organic disorders, and the endless variety of forms which this affection presents. An hysterical female sometimes complains of great pain and tenderness of the belly, and even screams if it be touched; she may have headache at the same time, and remain in bed during several days; but the pulse continues tranquil, and the skin is not hotter than natural. Many girls, however, have been bled repeatedly while in this state, under the idea that some inflammatory action was going on.

Pain about the region of the heart, accompanied with palpitations and occasional fainting fits, constitute another form which hysteria assumes, and may at first lead any one ignorant of the use of the stethoscope to suppose that organic disease of the heart existed.

Causes.—Females from fifteen to thirty years of age are most liable to hysteria, and it is generally observed in those of a highly nervous temperament, with spare habit of body; or in plethoric and fat persons with soft and relaxed muscles, who are subject to irregularities of the menstrual discharge.

The most common exciting causes are disappointed love, jealousy, undue excitement, ungratified desires, and all powerful mental emotions which act strongly on the nervous system, and tend to induce disorders of menstruation. Hysteria, in fact, depends almost entirely on the education, social position in life, mode of living, and moral training of females; many, from having been overindulged when children, become irritable, wayward, capricious, and, in a word, are so self-willed that the slightest disappointment or opposition brings on a paroxysm. Sydenham remarked long ago that, "Upon the least occasion they indulge terror, anger, jealousy, distrust, and other hateful passions; and abhor joy, and hope, and cheerfulness, which, if they accidentally arise, as they seldom do, quickly fly away, and yet disturb the mind as much as the depressing passions do; so that they observe no mean in any thing, and are constant only to inconstancy. They love the same persons extravagantly at one time, and soon after hate them without a cause; this instant they propose doing one thing, and the next change their mind, and enter upon something contrary to it, but without finding it. So unsettled are their minds that they are never at rest." People in general are not much inclined to sympathize with hysterical females, however formidable or alarming the fits may appear, because it is well known that this affection is in a great measure under their own control, and, in fact, in nine cases out of ten the paroxysm is the result of a fit of bad temper, or of some excitement which could not have arisen in a well-regulated mind.

Strong religious feeling, acting on delicate or weak-minded females, is another fruitful source of hysteria; and in such cases it is readily communicated from imitation and sympathy.

Treatment.—Two indications are to be attended to in the treatment of hysteria; the first is to shorten or moderate the violence of the paroxysm, the other to prevent the return of the fits.

When the fit is slight, the application of cold water to the head and neck, putting salt in the mouth, and *sal volatile*, or *aromatic vinegar* to the nostrils, are the means commonly put in practice, and sometimes with advantage; but, at all events, in mild cases the fit may be allowed with perfect safety to run its course. When the paroxysm is severe the first thing to be done is to prevent the patient from receiving injury by the violence of her struggles. She should be placed in bed in a well-aired apartment, her shoulders ought to be raised, and her dress loosened. If she be capable of swallowing, a teacupful of cold water or the following draught may be given:

Camphor mixture, two ounces,
Sal volatile (aromatic spirit of ammonia), a teaspoonful. Mix.

Or a teaspoonful of *æther* may be given in a little cold water. Should the face be flushed and the head hot, cloths moistened with æther are to be placed on the forehead, or wet towels or pieces of linen may be applied to the same part.

Treatment during the intervals.—In order to effect a radical cure of this affection, attention must be paid to the general health of the patient, and to the state of the digestive organs and womb. If the habit of body be full and plethoric, low diet and exercise are proper; but if the patient be delicate and her stomach debilitated, tonic remedies, such as small and repeated doses of *quinine*, and *preparations of iron*, are the most suitable remedies.

Should the disease be connected, which it very frequently is, with disorders of menstruation, I must refer the reader to a subsequent part of the work. (See *Women and Menstruation, Diseases of.*)

Valerian, castor, assafœtida, galbanum, and other remedies termed antispasmodic, are in very general use in the treatment of hysteria, but I cannot say that we have ever known any permanent benefit derived from them; and we believe that medicine, to have any decided effect in this disorder, must be directed towards improving the state of the digestive and uterine functions.

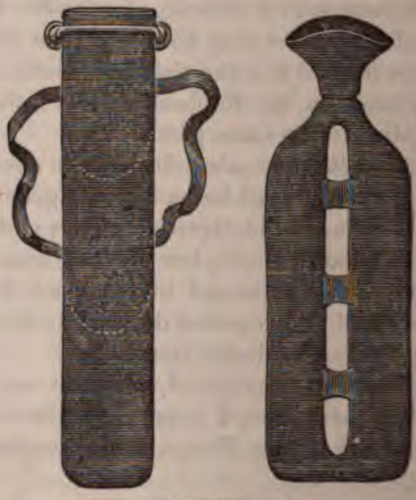
Hysteria may attack any part or organ of the body, and resemble organic disease. Like hypochondria, it is really a disease, and is to be treated accordingly. Moral influence can do much, but it cannot do everything. It is a nervous disease, and is to be managed on the same general principles as other nervous diseases.

It should always be remembered that hysteria is to woman what hypochondria is to man. Both are really diseases. Both are probably symptoms of some disturbance of the central nervous system. Both are increasing in frequency. Both are often premonitions of actual insanity. Both may occur at any time of life after puberty. Both diseases may often be relieved and cured by appropriate treatment.

(For principles and details of treatment see *Treatment of Nervous Diseases.*)

ICE-BAGS AND BAGS OF HOT WATER.

Dr. Chapman, of London, has introduced to the profession a method of treatment that consists in the application of rubber bags, filled with ice or hot water, to the spine. This method of treatment has been found to be quite successful in a variety of nervous diseases. They are recommended for *convulsions, neuralgia, sick headache, sea-sickness, epilepsy, St. Vitus's dance,* and a variety of other affections. The bags for holding the ice are simply a matter of



ICE-BAGS.

neatness and convenience. Ice wrapped in a cloth or towel serves our purpose very well. I have used this treatment successfully for sick headache.

ILIAC PASSION.

Iliac passion, or Ileus, consists of excessive vomiting, with obstinate constipation of the bowels. This dangerous disease may commence suddenly and terminate fatally in the course of four or five days; but cases of this description are fortunately very rare. It usually commences with acute griping pain, obstinate constipation of the bowels, retraction of the navel, and the usual symptoms of severe colic, which not being relieved by any mode of treatment, a still more distressing state supervenes. The patient is racked with violent pain; the belly becomes swollen, and tender to the touch; the pulse is weak, small, and quick; the thirst is urgent; the face appears anxious and shrunk; fæcal matter is vomited; cold sweats, hiccup, and frequent fainting fits follow, and death generally puts an end to the patient's misery. In some cases, acute pain is felt at a particular part of the abdomen, accompanied with heat of skin, quick pulse, thirst, and the ordinary symptoms of inflammation; in others there are no symptoms of fever; in the latter case life may be prolonged a considerable length of time.

Causes.—Ileus may arise from various causes, the principal of which are ruptures; one portion of the bowels passing within another, and becoming entangled; contraction, or stricture of the bowel; obstruction from cancerous or other morbid growths; bands formed by false membranes, strangulating or compressing a portion of gut; paralysis, or torpor of the bowels, arising from hardened fæces, impacted in some part of the intestinal canal; or it may be a symptom of inflammation of the bowels.

Treatment.—In every case the first thing to be done is to ascertain whether or not the disease is the result of hernia or rupture. A hernial tumor is sometimes so small that the patient is ignorant of its existence, or may not consider it worthy of notice; and females are often ashamed or unwilling to admit that they have any complaint of this nature. We ought not, therefore, to rest satisfied with the statement of the patient, but should examine the parts subject to rupture with the greatest care. The necessity of procuring the best professional assistance at an early stage of the disease, in order to avoid intense suffering and death, is absolute.

Another essential point to be attended to, before having recourse to any remedial means, is to ascertain whether or not the disease is accompanied by inflammation, the signs of which are, a constant acute, and burning pain in the belly, which is distended, tense, hot, and acutely sensible to the slightest pressure; urgent thirst, and high-colored urine. In this case, instead of giving opiates and strong purgatives, which would soon destroy the patient, recourse must be had to general and local blood-letting, and the means usually adopted to subdue inflammation of the bowels, of which the ileus may be only a symptom; and will then, of course, be removed along with the inflammation.

If the disease do not depend on hernia, and if no inflammatory symptoms be present, it then becomes advisable to administer purgatives and opiates.

TREATMENT OF ILIAC PASSION.

1. *Cathartics.—Castor oil* may be given in large doses, and may be injected into the bowels. Croton oil, a drop or two on the tongue, may be resorted to. We may inject into the bowels *Epsom salts* with warm water and molasses, and in large quantities. *Localized electrization* may be used with a powerful current.

If all these measures fail, we have reason to suspect that the bowels are obstructed, and should next try—

2. Opium in doses of one grain or less every half hour to relieve the pain, and if possible relax the bowels. Together with the opium try warm hip-baths, and injections of warm water in large quantities. Physicians sometimes use long tubes in such cases, and push them as far as possible up the bowels.

3. Inject air by air bladders or by large bellows. It is claimed that lives have been saved by this method of treatment.

INDIAN HEMP.

This is used chiefly in painful and spasmodic affections, and in cases where we are accustomed to employ opium and *belladonna.*

It is used to *produce sleep*, to relieve the pains of *neuralgia*, and in *delirium tremens.*

One form of Indian hemp is *haschish.* This is much used in the East. Its effects on the nervous system are peculiar, and sometimes alarming. It may produce a kind of double consciousness. I tried a dose once, and the effects on my nervous system were such that I never desire to repeat the experiment.

The dose is from half a grain to two or three grains. The tincture may be given in doses of from three to six drops on sugar.

It is not a good remedy for domestic use.

Indigestion. (See *Dyspepsia.*)

INFLUENZA.

Influenza, or epidemic catarrh, has generally been observed to commence suddenly, with chills or shivering, alternating with flushes of heat, loss of appetite, great lassitude, and debility. These symptoms are soon followed by pain and a sensation of weight in the forehead, sneezing, a copious discharge of thin acrid fluid from the nostrils, a sensation of rawness along the course of the windpipe, hoarseness, and dry cough. To these are conjoined anxiety and a feeling of oppression about the chest; pain in the back and knees, and shooting pains in different parts of the body and limbs; quick and weak pulse, and moist tongue, covered with white mucus.

The abruptness of the attack, the extraordinary debility, the severe headache, accompanied with giddiness, and the flying pains in the back, knees, and various parts of the body, distinguish this affection from common catarrh. (See *Cold in the Head* and *Bronchitis.*)

The duration of influenza varies from three or four days to a fortnight; but in aged and delicate people it frequently leaves considerable debility and susceptibility to cold for many months. It seldom continues longer in any place than six weeks, and generally, towards the termination of the epidemic, the symptoms are mild, and differ little from those of a common cold.

TREATMENT OF INFLUENZA.

Influenza at the outset is to be treated like a common cold. (See *Common Cold* and *Cold Powder.*)

In addition to these measures, the patients often need tonics. *Quinine* is given with benefit; sometimes the preparations of iron are of service. These tonics are not usually given at the commencement of the attack, but subsequently, after the system has become more or less exhausted. In this disease it is more necessary to have medical advice than in a common cold.

Sometimes when the epidemic prevails in any place, no amount of caution can prevent our taking it. Those who keep carefully at home and who never expose themselves are as much, if not more, liable to be attacked than those who move freely about in the open air. Sometimes hundreds are attacked almost simultaneously.

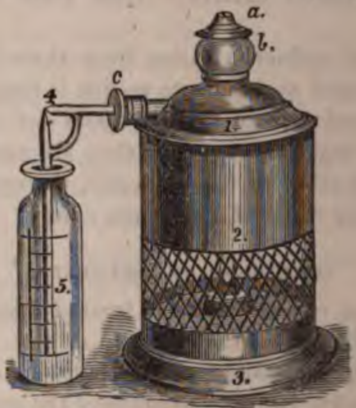
Daily ablution with cold water is strongly recommended by nearly all the best authors on these affections, and several distinguished medical men speak of the advantage which they have personally derived from it. Sir Astley Cooper makes the following observation with regard to this practice:

"The methods by which I preserve my own health are temperance, early rising, and sponging my body every morning with cold water immediately after getting out of bed, a practice which I have adopted for thirty years; and though I go from the hot theatre into the squares of the hospital, in the severest winter nights, with merely silk stockings on my legs, yet I scarcely ever have a cold."

INHALATIONS.

Of late years the practice of taking medicine by inhalation has been revived, and has now resumed some of its former popularity. Different styles of apparatus have recently been devised that enable us to administer a large variety of medicines in the form of *cold or hot spray*.

One of these is represented in the accompanying cut.



STEAM ATOMIZER (INHALER).

There is no question that much good may be accomplished by inhalations; but their importance has, I think, by some been overestimated. They are of decided assistance in the treatment of diseases of the larynx and bronchial tubes. They afford relief in croup. They have been used as a means of relief in consumption.

Inhalation is to many a very agreeable mode of taking medicine, and on that account patients are sometimes inclined to over-estimate their value—to form too extravagant hopes of their efficacy.

Charlatans have availed themselves of this popularity of inhalations, and have terribly deceived the people. They have professed to cure incurable diseases, have held out false hopes, and fleeced the unsuspecting.

The people should understand that inhalations are not panaceas; that they are pleasant and effective *aids* to our other methods of treatment, in a certain class of diseases, and under judicious advice.

DOSES OF REMEDIES FOR INHALATION.

Tar-water, one to three drachms,
Lugol's solution of iodine, three to ten drops,
Chlorate of potassa, five to thirty grains,
Carbolic acid, five to fifteen drops,
Tannin, ten to twenty-five grains,
Alum, ten to fifteen grains,
Muriate of ammonia, ten to thirty grains,
Laudanum, five to twenty drops,
Nitrate of silver, one to five grains.

These medicines may be placed in a large or small quantity of water, according to the nature of the apparatus used. Patients should not use the more powerful substances, such as nitrate of silver and carbolic acid, without caution. The different forms of apparatus are usually accompanied by general instructions for their use. It is always safe to make the first inhalations *short—say five or ten minutes*, according to substance used. After inhaling *hot spray*, it is well to rest a few moments before going into the open air, in order to avoid taking cold. This caution is not necessary after cold inhalations.

IODIDE OF POTASSIUM.

This remedy is now much used, and in a variety of diseases. It is given in *syphilis*, both to cure the disease itself and to counteract the evil effects of mercury. It is given in *rheumatism*, and is sometimes very successful in that malady. It is given in *inflammation* of the brain to promote absorption of the fluid. For the same purpose it is used in *pleurisy*. It is given in *lead-poisoning*. For lead-poisoning it is the best remedy we have. The iodide of potassium sets the lead free, and allows it to escape through the urine.

Iodide of potassium is successfully given to promote absorption of enlarged glands. It is also useful in consumption. The dose is from *three to ten or fifteen grains* in water.

IODINE.

Iodine is obtained from the ash or cinder called *kelp*, which is procured from burning sea-weeds (*algæ*).

Iodine is principally valued for the extraordinary power it possesses in promoting absorption; hence it is employed in Derbyshire-neck (bronchocele), chronic enlargements of the liver, spleen, testicles, uterus, &c. In various scrofulous affections it is the most efficacious remedy we possess. It is now extensively used in combination with various other substances.

INSANITY.

Insanity receives various names, according to the special manner in which it is manifested. *Mania is general insanity.*

Monomania.—Any one who is insane on some *one* subject is called a monomaniac.

Under this head there are many subdivisions.

Dipsomania (or methomania, or oinomania). (See *Dipsomania.*) Those who so lose their self-control that they cannot touch wine or other liquors without making beasts of themselves are frequently called *dipsomaniacs.* Very many of our drunkards, especially among the better classes of society, have diseased brains, and are really dipsomaniacs.

Pyromania.—Those who have an insane desire to set buildings on fire are called *pyromaniacs.* Some boys have been thus afflicted.

Kleptomania.—Those who cannot avoid stealing are called kleptomaniacs. Some of the best educated people in the land have been thus diseased. There have been ladies of abundant wealth and high social position who have had the habit of purloining all sorts of articles from the stores where they trade, and the houses of friends where they visited. There have been clergymen who have been unable to repress their tendencies to steal, notwithstanding all the unpleasant consequences that would result from exposure.

Homicidal Mania is an insane propensity to kill. There is a great prejudice against the use of this phrase, because it has sometimes been unfairly laid hold of to screen real criminals. There is no question that there is such a form of mania, and that those who suffer from it are not free moral agents. There is no definite *line where sanity ends and insanity begins.* The question of *insanity is simply a question of degree.* Each case must be studied by itself. There should be in every State a board of sworn commissioners, capable and honest experts in this department, to whom all doubtful cases should be referred. It should be for them to give evidence in criminal trials and to decide whether patients are or are not fit candidates for an asylum.

The present laws on this subject are a disgrace to our civilization. There are throughout the land a great number of insane people who are not fit for liberty. They are a nuisance to themselves and to all their friends. They turn their households into hells. Many of them are liable at any time to commit some terrible offence against peace and order. They are not free moral agents; their brains are diseased. They should be placed under some form of restraint. It is not always necessary to place such patients in an asylum. Insanity is a malady of degrees, and the restraint of the insane should be a matter of degree.

Under the present laws those who are so unfortunate as to have insane relatives are oftentimes obliged to endure their miseries until death brings relief. If they attempt to place their insane fathers or mothers, or brothers or sisters, or other relatives, under restraint, they are very apt to excite odium against themselves, especially if the relatives happen to be very aged and wealthy.

The remedy for this evil is to have in every State a sworn and able commission, who shall at least be as much above reproach as our judges, whose office it shall be to decide such cases.

TREATMENT OF INSANITY.

Every case of actual or of suspected insanity must be treated by itself. In all cases the best of medical advice should be obtained. Only those who are skilled in the study of disease can judge whether or not separation and confinement are necessary.

In these days lunatics are treated kindly. They are allowed all the liberty and all the favors consistent with their own welfare and the welfare of society.

I need not say that the great majority of those who are in the milder and incipient stages of insanity—as I have described them—need no confinement at all. They are about us on every hand, and mingle with success in the various activities of life. It is only when insanity becomes violent, when it positively disturbs society, when it unfits one for the duties of life, that it must be treated by separation.

These mild and incipient stages must be treated just like nervous diseases in general. (See *Treatment of Nervous Diseases.*)

But in those cases where medical advice adjudges that separation is necessary, the friends of patients should not hesitate. Much of the prejudice against our modern asylums is unfounded. In the main the patients are treated with all possible kindness and consideration, and the results of the treatment are as satisfactory as can be expected.

It is a mistake to suppose that insane patients never perfectly recover. There is always hope of those who are young. After forty or fifty the chances of recovery diminish with the age. Some of the best and greatest men that the world has ever seen have been at some period of their lives insane.

IPECACUAN.

Ipecacuan is well known as a mild and efficacious emetic; for this purpose it is given in powder, in the dose of from fifteen to thirty grains, mixed with a little warm water; or ten grains of it may be administered, combined with one grain of tartar-emetic. The *wine of ipecacuan*, commonly called *hippo wine*, is well adapted for the diseases of children where emetics are desirable. The dose is one or two teaspoonfuls, repeated at intervals of a quarter of an hour, until vomiting is produced.

Ipecacuanha lozenges generally contain each from a quarter to half a grain of the powdered root, and are much used to promote expectoration in chronic affections of the lungs.

Ipecacuan combined with opium forms the celebrated sudorific remedy called *Dover's powder.*

IRON.

Iron, so indispensable to the welfare and happiness of mankind, is, as the great chemist Fourcroy states, perhaps the only metal possessed of medicinal properties which has no poisonous quality. Indeed, there are few remedial agents of more importance than the preparations of iron. The salts of iron are deservedly considered to be invaluable in the various chronic affections occurring in connexion with that state of the body called, in medical language, *anæmia*, in which the blood is deficient in quantity, and probably altered in quality. The symptoms which indicate this condition of the system are a soft, flabby state of the flesh, pale countenance, a peculiarly pallid appearance of the lips, general debility, loss of appetite, occasional palpitation of the heart and shortness of breathing on any sudden bodily exertion. This state is most frequently met with in females, and generally in those who are affected with obstruction of the menses (*chlorosis*). The diseases in which the preparations of iron have been found most serviceable are scrofula, rickets, dropsy, menstrual disorders, and various nervous affections, as epilepsy, St. Vitus's dance, hysterics, asthma, and neuralgia.

In persons of a full habit of body, with florid countenance, in those who have a tendency to inflammatory diseases or apoplexy and in all cases of chronic inflammation, iron is not admissible in any form.

The subcarbonate, or prepared rust of iron, has been frequently given in tic douloureux and other nervous diseases to the extent of an ounce in the course of twenty-four hours; but though such doses may be given with impunity, it does not appear to be really necessary, under any circumstances, to exceed three drachms a day; and indeed, in most cases where this remedy is indicated, scruple doses, if continued for a sufficient length of time, will be followed by all the good effects which iron is capable of producing. The method generally adopted is to commence with ten grains three times a day, increasing the dose gradually to the extent of a drachm. In obstinate cases of chlorosis, and in the discharge from the vagina, called the whites, it is often advisable to administer drachm doses for a considerable length of time.

The tincture of the muriate of iron, or *tincture of steel*, as it is termed, is a very agreeable and convenient form of administering iron. The ordinary dose is from ten to thirty drops, three times a day, in cold water, or conjoined with an infusion of quassia, gentian, or orange peel; or it may be given once a day, in a glass of soda-water. This is considered the most suitable preparation in indigestion arising from functional derangement or weakness of stomach; but iron and all other tonic remedies are improper when the alimentary canal is in an irritable condition. In retention of urine, from spasm at the neck of the bladder, the tincture of steel, in small doses frequently repeated, is an excellent remedy; ten drops to be taken every ten minutes, until some relief is afforded.

The sulphate of iron (green vitriol) produces sickness at stomach when used in full doses, and should therefore be taken at first in the dose of half a grain three times a day. It may be used in the following form with great advantage as a substitute for waters impregnated with iron:

Sulphate of iron, half a drachm,
White sugar, a drachm and a half. Mix, and divide into twelve powders.
Bicarbonate of soda, half a drachm,
White sugar, a drachm and a half. To be also mixed, and divided into twelve powders. One of each to be dissolved separately in water, and taken in a state of effervescence.

Other preparations of iron are *iron by hydrogen*, *pyrophosphate of iron*, *acetate of iron*, &c.

Pyrophosphate of iron is now very much used. It is given in combination with *quinine* and *strychnine*. It is a prominent ingredient in Caswell's and in Wyeth's tonic preparations.

ITCH.

The face is the only part which it does not attack. Its immediate cause is the presence of an insect, *acarus scabiei*, which is not situated in the vesicle itself, but at the termination of a small reddish furrow with which it communicates. This insect may be detected by the microscope.

Tailors, old-clothes men, seamstresses, and the medical attendants and servants of hospitals, are most frequently affected with this filthy disease. In grown-up people from ten to twenty days elapse between the infection and the breaking out of the eruption; in children it appears at an earlier period, generally from four to six days.

Treatment.—The itch never gets well without treatment. The remedy generally resorted to is sulphur, which seldom if ever fails in curing the disorder. The *sulphur ointment* of the shops, or the flour of sulphur mixed with butter or lard, rubbed in five or six times on the parts affected, effectually destroys the *acarus*. It is well to take a warm bath so as to thoroughly cleanse and soften the skin before rubbing on the sulphur ointment. (See *Skin, Diseases of.*)

JALAP

Is a familiar remedy, that needs no description. Like calomel it has been much abused.

JAMES'S POWDER.

The *antimonial powder* of the pharmacopœia is an imitation of this empiric remedy, and both these preparations of antimony are used to promote perspiration in inflammatory diseases and fever; but the tartrate of antimony (tartar-emetic) in small doses is now generally preferred, because it acts with a greater degree of certainty than any other antimonial. The ordinary dose of James's powder or of the antimonial powder is from five to ten grains, mixed with a little jelly; but it has been frequently given in much larger doses without producing any perceptible effect. It is not much used in these days.

JAUNDICE.

Jaundice is characterized by a yellow color of the eyes, skin, and urine, and by the white or clay-colored appearance of the evacuations from the bowels.

The circumstances which impede the passage of the bile into the bowels, and consequently produce jaundice, are various. The obstruction may arise from gall-stones in the biliary ducts, from the bile being preternaturally thickened, from enlargements of neighboring parts, from accumulation of mucus in the duodenum plugging up the orifice of the duct, or from inflammation of the liver or duodenum, or of the gall ducts themselves. But jaundice often arises under circumstances which do not admit of any explanation of the immediate cause of the obstruction; for example, it occasionally arises suddenly from violent mental emotions, as intense grief, terror, or a violent fit of rage; sometimes again it makes its appearance slowly, in consequence of long-continued domestic grief, jealousy, or disappointed ambition; it may also be brought on in consequence of the pain and shock given to the nervous system from falls, blows on the head, or any other part; from the reduction of a dislocation, the amputation of a limb, or the enduring of any other severe surgical operation; from the bite or sting of venomous animals, &c. The nature of several of the varieties of jaundice is still little known; cases often occur in which the treatment is on this account rendered very uncertain. Indeed it is often necessary to trust almost entirely to the efforts of nature for the removal of the disorder.

The yellow color is first observed in the eyes; it then extends to the face, neck, and upper part of the chest; and at last the whole skin becomes imbued with it; troublesome itching, or a tingling sensation of the surface of the body, usually accompanies the discoloration of the skin. The urine at first is clear and of a yellowish tint; but as the disease advances it acquires a saffron color, and ultimately becomes dark green, or of a mahogany color, and deposits a thick slimy sediment. The urine, even when it has acquired a very dark color, tinges the linen of a bright yellow. In general there is a great tendency to constipation of the bowels; the evacuations are scanty, clay-colored, or white, and voided with difficulty. To these symptoms are added great depression of spirits, watchfulness, a bitter taste in the mouth, furred and yellow tongue, nausea or vomiting, loss of appetite, thirst, and sometimes shivering, copious perspiration or dry skin, and perhaps pain at the stomach. To some jaundiced patients all objects appear of a yellow color, but this is by no means a common symptom of the disease.

Treatment.—Our knowledge is very imperfect with regard to many phenomena connected with jaundice, and until the advances of science throw light on these obscure points, the treatment must be confined chiefly to controlling or removing the symptoms.

Gall-stones are always formed in the gall-bladder, and as long as they remain there are not attended with pain or any inconvenience· but when they find their way into the gall ducts, particularly if their size happen to be large, they cause jaundice, and the most excruciating pain; the latter is not constant, but recurs in violent paroxysms, and is said to be more severe than that which results from the most acute inflammation. The pain may come on several days in succession, and continue several hours each time; it is attended with occasional shivering and profuse perspiration, but not with feverish symptoms. When the paroxysm continues long, it induces extreme lassitude and exhaustion. As soon as the stone escapes from the duct into the bowels the urgent symptoms cease, and recovery soon follows; sometimes, however, it falls back into the duct, and in this case, though the patient is likewise relieved from his suffering, he has reason to anticipate a recurrence of the disorder at some future period.

The treatment in this species of jaundice consists in alleviating the pain by means of opiates. Fifty drops of *laudanum*, the third of a grain of the *acetate of morphia*, or *hypodermic injections of morphine*, should be given and repeated at the expiration of an hour, or after a longer interval, according to the urgency of the case. A warm bath may be of considerable service, and the patient should remain in it until a slight degree of faintness is produced. After two or more doses of the anodyne medicine have been taken, a dose of *castor-oil* is to be administered, and the bowels are to be kept gently open throughout the disorder by mild doses of the same or of some other purgative. If the bowels be obstinately constipated, which is not unfrequently the case, the compound rhubarb pill or a dose of *podophyllin* (see *Podophyllin*) should be administered, and the dose repeated as often as may be found necessary. Emetics are seldom required in any form of jaundice, and when it arises from gall-stones they cannot be administered with safety. Warm fomentations, applied constantly over the pit of the stomach, may afford some relief, and effervescing draughts may be given to allay vomiting.

Treatment of jaundice during the intervals is oftentimes a matter of difficulty. Each case must be studied by itself, and advice should be obtained in all obstinate cases, at least.

It should be remembered that jaundice is merely a *symptom*, or an effect, and that it must be treated by treating the cause. If we must work in the dark, we can by those remedies that act upon the liver, or are supposed to do so. It is proper to state just here, that many physicians now doubt whether calomel has any specific effect upon the liver, as has been generally supposed. There are many who use *podophyllin* instead of calomel. It may be given in doses of from one-half of a grain to one or two grains.

Nitro-muriatic acid is believed to have an effect on the liver. It may be given in sweetened water. The drink may be made agreeably sour, and taken before meals. *Hard cider* is a good remedy for jaundice, and should be faithfully tried. *Dandelion* is also supposed to have some influence on the liver. It is well also to try some of the tonic preparations, such as Wyeth's or Caswell's elixirs. (See *Tonics.*)

If internal medicines fail, it is proper to resort to the *movement cure* or *electrization.* Travelling, a change of air and scene, sometimes succeed when medicine fails.

KIDNEYS, DISEASES OF.

A fit of the gravel is caused by the descent of gritty particles like sand, or of small stones (*renal calculi*), from the kidney, along the ureter to the bladder. Small stones sometimes reach the bladder without occasioning much pain or uneasiness, but in general they give rise to very distressing symptoms. The patient is suddenly seized with severe pain in the region of the kidney, extending along the ureter to the bladder, and even to the point of the penis; and generally accompanied with great tenderness at the part of the belly corresponding with the portion of the ureter in which the stone is arrested in its progress. There is also a dull pain, or sensation of numbness, at the inside of the thigh, and sometimes of the leg, of the side affected, with painful retraction of the testicle. The urine is passed in small quantity, tinged with blood, or mixed with clots; and there is frequent vomiting, with violent sickness at stomach, and extreme anxiety. The duration of this affection is variable, and depends on the resistance offered to the passage of the stone towards the bladder; as soon, however, as it gets into that organ, the symptoms cease in the same abrupt manner in which they commence. In general, after a long or shorter time, the stone, with perhaps a considerable quantity of gravelly particles, passes out of the body along with the urine; but sometimes the painful symptoms above described are only a prelude to a disorder of a much more serious nature. The stone, instead of being discharged along with the urine, remains in the bladder, gradually increases in size, and occasions frequent attacks of the most excruciating pain, from which the patient has no means of escaping, except that of submitting to a formidable surgical operation.

Treatment.—The treatment of this affection should be chiefly directed to two points:

1. To mitigate the pain.

2. To facilitate the progress of the stone from the kidney to the bladder.

Opium, which may be regarded as our sheet-anchor in this affection, is then to be given in the dose of a grain to two grains, and repeated every two or three hours, or at longer or shorter intervals, according to the urgency of the symptoms. When the stomach is very irritable, the best way of administering this remedy is in the form of clyster; a drachm of *laudanum*, with half a teacupful of thin starch, may be injected every two or three hours, or at longer intervals, according to the effect which it produces; or a *suppository*, containing two grains of solid opium, may be used. In whatever manner or form opium is exhibited in this distressing disorder, it has the effect of soothing the pain, tends greatly to relieve spasm, and consequently favors the descent of the stone into the bladder. The warm bath should be employed, and afterwards warm fomentations are to be applied over the abdomen and loin of the side affected. The pain is sometimes so severe that the perspiration is seen to drop from the patient, and even fainting fits or convulsions may be brought on. Great languor and debility necessarily follow this extreme suffering; care must therefore be taken to give wine, brandy and water, and other stimulants, in quantities suited to the degree of exhaustion. Stimulating diuretic remedies are not to be given, but the patient may drink freely of linseed tea, decoction of marsh-mallow, or other demulcent drinks.

BRIGHT'S DISEASE—ACUTE FORM.

The symptoms of the acute form of Bright's disease are pains in the limbs and back, difficulty of breathing, nausea and vomiting, pain in the head, dropsy of the face and limbs, and *albumen in the urine*, as revealed by chemical tests. All these symptoms come on shortly after an unusual exposure to cold. They may also follow scarlet fever.

The majority of cases recover; some go on to the chronic form. Some die from the poisoning of the blood by urea (*uræmia*).

TREATMENT OF ACUTE BRIGHT'S DISEASE.

1. Keep the skin warm and open by hot-water baths and hot-air baths.

2. Keep the bowels free by purgative medicines.

3. Relieve the kidneys by dry cups over the loins. (See *Dry Cupping.*)

Most of the inflammations of the kidneys will come under either acute or chronic Bright's disease.

There may, however, be a *congested* state of the kidneys, that does not go on to actual inflammation. *Congestion* may be treated by warm baths, purgatives, and dry cupping of the loins.

One great cause of the fatal character of Bright's disease is the presence of *urea* in the blood (*uræmia*). The urea is exceedingly poisonous. The convulsions of pregnant women are frequently due to the presence of urea in the blood.

CHRONIC BRIGHT'S DISEASE.

This disease of the kidneys, which has recently attracted so much attention, received its name from Dr. Bright, of England, who was the first to closely study and define it.

The leading symptoms of Bright's disease are:

1. Albumen in the urine.
2. Casts of the tubes of the kidneys found in the urine by the microscope.
3. Dropsy, general or local.
4. Headache and dimness of vision.
5. Disorder of digestion.
6. Stupor, vomiting, or diarrhœa.

There are several varieties of this disease. In all of them the kidneys are more or less diseased. In all of them it is necessary to call in the aid of the microscope (see *Microscope*) and chemistry before we can pronounce an opinion upon any case. In all of them the probabilities are that the patient will never entirely recover, although he may live a number of years.

Many of the symptoms of Bright's disease—indigestion, headache, dimness of vision, etc.—are also the symptoms of many other conditions. It is therefore necessary to take all the symptoms. It is necessary to have the urine examined by chemical tests, and if possible by the microscope.

The chemical test that is usually employed is the addition of a few drops of nitric acid to a little of the urine in a test-tube, and then heating it. If albumen is present there will be a whitish deposit, somewhat resembling the white of an egg.

Those who suspect that they may have Bright's disease of the kidneys should consult some good medical authority, and abide by his opinion.

Many who fear that they have some disease of the kidneys really have no such disease. Many who have pains in the back are apt to imagine that they have disease of the kidneys. Nothing is so unreasonable as this fear. (See *Backache.*) *When Bright's disease actually exists there is usually no pain in the back at all.*

Chronic Bright's disease advances slowly and insidiously. The kidneys may be diseased a long time before the patient begins to suspect that he is laboring under serious disease.

Patients with chronic Bright's disease often suffer at the same time from bronchitis.

TREATMENT OF CHRONIC BRIGHT'S DISEASE.

1. To keep the skin open, and thus to relieve the kidneys. Use warm baths. Give the following prescription:

Mindererus spiritus,
Syrup of ipecac,
Tincture of chloride of iron, equal parts.
One teaspoonful three times a day.

Flannel should be worn next to the skin.

2. To sustain the system.

Give tonics of various kinds. Cod-liver oil, the preparations of iron, quinine, strychnine—all may be tried. The diet should be nourishing and digestible.

3. To relieve the dropsy. (See *Dropsy, Treatment of.*)

The patient should avoid all careless exposure to cold, and should be as temperate as possible in his habits.

In spite of all that can be done, the tendency is toward a fatal result.

KREASOTE.

Kreasote has been found useful in checking spitting of blood from the lungs, and in cases of sickness and vomiting dependent on pregnancy, or connected with nervous and hysterical symptoms; it has also been recommended as a preventive of sea-sickness. The dose is one drop three or four times a day, formed into a pill with liquorice powder and mucilage, or given in camphor mixture, and may be gradually increased to eight drops.

A small portion of lint, or soft linen rag, moistened with kreasote, placed in the hollow of a decayed tooth, has an astonishingly rapid effect in allaying the pain, and is deservedly considered one of the best local applications yet discovered for toothache. It is one of the best of remedies in common diarrhœa.

LARYNGITIS, OR INFLAMMATION OF THE LARYNX.

This may be *acute* or *chronic*. The acute form is not very common, but when it occurs is liable to be a very severe disorder. The symptoms are sometimes alarming, and the danger is great. The symptoms are great *hoarseness, pain over larynx, violent coughing, and difficulty of breathing.* Surgeons sometimes resort to opening the wind-pipe in this formidable disease. Patients can do little but apply leeches over the throat, and take soothing inhalations. (See *Inhalations.*)

CHRONIC LARYNGITIS.

This disease is exceedingly common. It is also very susceptible of relief. The symptoms are *spitting*, *hoarseness*, sometimes loss of voice (aphonia), coughing, difficulty of swallowing, &c.

The laryngoscope (see *Laryngoscope*) will at once settle the question in any doubtful case. It will reveal a chronically inflamed condition of the vocal cords and of the other portions of the larnyx, and sometimes there will be seen ulceration and loss of substance.

From my translation of Tobold's "Chronic Diseases of the Larynx" I select the following description of this disease :—

"In certain cases the change of the voice manifests itself only in the morning to a very slight degree, but in the course of the day it becomes much more marked. The respiration is never disturbed in these cases, unless neoplasms which narrow the cavity, or a severe bronchitis exist at the same time. The feeling of roughness or tickling occasions repeated hemming and expectoration. There may be with it an habitual, gentle cough, and sputa may even be expectorated, rolled up in little balls, and tinged with blood. Afterwards, in the more advanced stages of this form of inflammation, there is more violent coughing, with spasmodic paroxysms, and this affection may be much increased by an intervening acute catarrh.

"The general condition is usually undisturbed.

"The course of the disease is often very irregular, unless local treatment is employed, and the evil tends rather to increase than decrease. So long as the patient is kept quiet the complaint recedes, while on some trifling cause all the symptoms become worse. In general the evil condition becomes entirely corrected under proper treatment, after a shorter or longer time, without leaving behind any organic disturbance in the vocal apparatus.

"It should not be forgotten that mucous membranes that have for a long time been affected with inflammation are very prone to relapse after complete or partial recovery, provided considerable vigilance be not exercised. This is especially true of disease of the respiratory passages, and of this fact patients should always be forewarned.

"One of the greatest and most annoying difficulties experienced by laryngologists is the recklessness with which patients expose themselves to night air, and to other injurious influences, while taking a course of treatment for pharyngitis or laryngitis.

"Amid the cold, dampness, and variations of our northern climate it is often impossible to avoid these relapses, even though every hygienic law be sacredly observed.

"In the milder and not very old forms of chronic laryngitis, rest of the organs, with other appropriate hygienic management, will be followed by good results.

"The protection of the organ of speech must be regarded as a condition *sine quâ non*, especially in the female sex. It forms an important adjuvant with every general as well as local treatment. The larynx, with its inner structures, is so delicate and movable an organ, that all mechanical influences are at once more sensitively felt by it when it is once affected with disease, than by any other part of the human body.

"Therefore the patient should avoid all loud speaking and singing, and all talking in the open air in cold weather, especially while walking. Very irritable, sensitive individuals may use a respirator with advantage, and may wear a flannel jacket, or any tight-fitting close jacket, next to the skin, especially if they are inclined to perspire easily. Laborers who are exposed for a length of time to a pernicious atmosphere, filled with dust or irritating chemicals, must select an occupation that allows them to live in healthy rooms, where the air is not too dry, but rather is somewhat moist.

"The diet of weak persons should be very nourishing and blood-enriching, and they should wholly abstain from all spicy and acid foods that irritate the mucous membrane, but especially from all spirituous drinks, strong beer, and other heating *liquids* that cause congestions.

"Therefore staying for an unreasonable length of time in restaurants where beer-drinking is going on, and where the thick tobacco fumes darken the air, is to be forbidden most decidedly.

"Continual inhalation of the smoke of tobacco is without doubt far more injurious and irritating to many than the act of smoking itself. I therefore allow a moderate amount of smoking, provided other symptoms do not imperatively forbid, to those who are unquestionably affected with a mild form of laryngitis, inasmuch as I have not observed therefrom any marked disturbances either of a subjective or objective character. As appropriate drinks, I usually recommend milk, cocoa, soda-water alone or with milk, red wine and sugar water.

"Among the so-called hygienic domestic remedies, the drinking of warm water in the morning, and the eating of the roe of herring, sometimes afford a little relief; but we can no more expect a complete cure from these than we can from the hydropathic packings of the throat so much praised by the laity and even by the physicians. They may temporarily diminish the subjective symptoms, but can never accomplish a complete cure, as may be shown by a daily inspection of the parts."

In this country and in England the so-called "dysphonia clericorum," "clergymen's sore-throat," has attracted considerable attention, and was at one time quite fashionable.

There is in this disease nothing that is peculiar, nothing that is distinct from the inflammations of the same parts in laymen.

It is probable, however, that clergymen are more frequently the victims of the various grades of inflammation of the larynx than any other class of professional men.

The causes of this discrepancy are quite obvious.

1. Clergymen do most of their speaking on the Sabbath, oftentimes under great pressure, and little or none during the week. The vocal organs are therefore periodically overworked.

Our successful and busy advocates speak more than clergymen, but their labor is more evenly distributed from day to day.

2. Most of our clergymen affect the "pulpit tone," which is to the last degree unnatural, and is as harmful to the vocal organs as it is to the cause they advocate. Lawyers usually speak in a more natural conversational tone, and are not as closely confined to their notes.

3. Until recently, clergymen have felt it to be their duty to remove the covering that God designed for the throat—the beard, and to substitute the white cravat of many folds.

This sinful custom is, however, passing away, and with it, in a certain measure, the disease that it invited.

To these three special causes, then, we must look for an explanation of the prevalency of "dysphonia clericorum," and not to other general harassments of their calling; for it is abundantly established by statistics that clergymen are the longest-lived of any class except farmers.

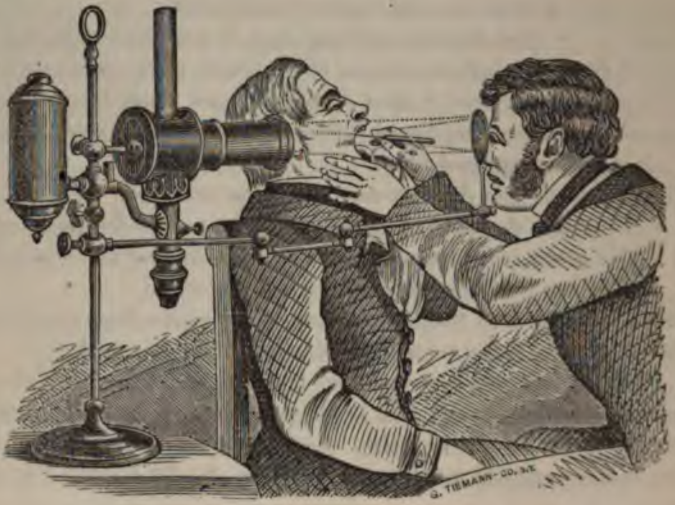
The local treatment of this disease consists in the application of solutions of nitrate of silver, or alum, or iodine, or tannin, or glycerine, or carbolic acid to the diseased membrane by means of sponges or brushes. Sometimes physicians make these applications with the aid of the laryngoscope.

At home patients may take inhalations. (See *Inhalations.*)

The treatment should be followed up perseveringly. Much relief, and sometimes permanent cure, may result.

LARYNX, DISEASES OF.

The larynx is liable to very many diseases, only a few of which can be spoken of here.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LARYNGOSCOPE.

Since the invention and popularization of the laryngoscope we are much better able to study the diseases of the larynx than formerly, and can also treat them much more successfully.

The laryngoscope consists of a reflector to send the light into the throat, and a small mirror to receive the image of the vocal cords. (See cuts of *Laryngoscope.*) The discovery and popularization of this instrument are due to two Germans, Czermak and Türck. It is now quite extensively used by physicians. By means of this apparatus it is possible to see the vocal cords with perfect distinctness. When sounds are made they open and close with great rapidity. (See cuts of *Larynx* under *Anatomy* and *Physiology.*)

It is also possible to get a view of the rings of the windpipe below the vocal cords.

Among the diseases which are found in the larynx by means of the laryngoscope are the following:

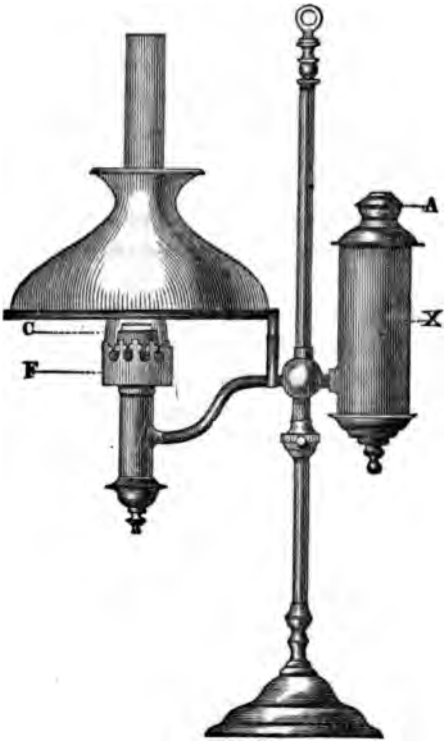
Acute and chronic inflammation. (Laryngitis.)
Tubercular disease. (Laryngeal phthisis.)
Tumors and cancers.

Paralysis of one or both of the vocal cords, or of the cartilages or muscles that move them.

Loss of substance of some portion of the larynx.

LAMP FOR THE LARYNGOSCOPE.

In examining the larynx with a laryngoscope a good light is needed. The one which I prefer is represented in the accompanying cut. It is called the *Saint Germain*, or *German Study* or *Office Lamp*. When used for the purpose of examining the larynx, the porcelain shade is removed. Tobold's lenses are placed around the chimney, and the light is reflected by the reflector against the small mirror in the back part of the throat. (See *Laryngoscope*.)



LAMP FOR THE LARNYGOSCOPE.

A X is the holder that contains the *kerosene* oil.
C is the cylinder on which the circular wick is placed.
F is the chimney-holder.

This lamp gives a mild, steady light, and, for those who have *weak eyes* is far preferable to the wretched lamps that are too frequently used. It is much pleasanter for the eyes than gas-light.

Loss of voice, hoarseness, expectoration, pain, difficulty of breathing, cough and general debility—these are some of the general symptoms that accompany many of these diseases of the larynx. The laryngoscope helps us to determine just *what* the disease is that causes these symptoms. It has therefore completely changed the treatment of laryngeal diseases.

Quite a number of errors prevail in regard to the diseases of the throat.

1. *That the inflammations of these parts "work down," and cause consumption*

Unprincipled charlatans have pushed and advertised the idea that consumption *begins* in the throat. The truth is that the deposit of tubercles *first* appears in the lungs. *The throat is not affected until later.* When consumptive patients suffer also from serious diseases of the throat we may generally rest assured that the lungs were first attacked, although the patient was not aware of it. *Tuberculous disease of the larynx is rarely cured. Ordinary inflammation of the larynx, even of the chronic form, may often be relieved and cured.*

It is for the physician to decide by the aid of the laryngoscope, if possible, what the disease is, and what treatment must be used.

Loss of Voice (Aphonia) is a very common symptom. It may be caused by *inflammation of the vocal cords*, by *foreign growths*, and by *paralysis*. Sometimes the patient loses his voice entirely, but most frequently is able to whisper. In many cases it is simply an aggravated degree of hoarseness. *Loss of voice* may last a short time, or for many months and years.

The *Treatment* of loss of voice consists in treating the disease that causes it. (See *Laryngitis.*)

When it depends on paralysis there is one remedy that is more efficacious than any other—*electricity*. This may be employed in the form of *localized* or *general electrization*. (See *Localized Electrization* and *General Electrization.*)

The latter method is the more convenient, and in cases associated with general debility more efficacious.

Sometimes patients who have lost their voice recover it very suddenly after any fright or excitement.

LAUGHING-GAS (NITROUS OXIDE).

This was first described by Sir Humphry Davy. Dr. Wells, of

Hartford, first used it to destroy sensibility in extracting teeth. The gas is made from *nitrate of ammonia* by heating and infiltration.

The gas is administered through tubes. At the present time it is used chiefly to produce insensibility during the extraction of teeth. It may, however, be used instead of chloroform and æther during some of the operations of minor surgery, such as opening abscesses, tearing out toe-nails, &c.

It is a safer anæsthetic than æther or chloroform. I have frequently administered it, and sometimes to quite feeble patients. I have never known any bad effects from its use. I would give it even to the young children, if necessary. In these days it seems to me to be entirely unnecessary to bear the pain of surgical operations.

Were it not for its bulk, *laughing-gas* would be used much more than it now is for surgical operations. It takes several gallons of the gas usually to make a patient unconscious. This gas must be carried in bags, and these bags occupy much space, while æther or chloroform can be carried in the pocket. *Nitrous oxide* is called "*laughing-gas*" because some people laugh and make fools of themselves while under its influence; but it does not produce this effect on all. Æther and chloroform will sometimes cause foolish laughter.

The use of laughing-gas has been popularized mainly through the lectures and efforts of Colton.

It is believed that the original experiments of Horace Wells, of Hartford, with laughing-gas suggested to Morton the idea of trying to produce insensibility by æther.

LEAD.

The acetate or sugar of lead is the only preparation of this metal used internally; from its astringent and sedative properties it is considered a powerful remedy in checking profuse bleeding from the lungs, womb, and other internal organs; we have given it repeatedly in urgent cases of hemorrhage, to the extent of ten grains in the course of twenty-four hours, mixed with a little distilled vinegar; two or three drops of Battley's opiate are usually given with each dose. It has been also used with great advantage, combined with opium, in cases of chronic dysentery and diarrhœa. Twelve grains to a scruple of it dissolved in a pint of water, with the addition of a little vinegar, are used externally as a lotion to inflamed surfaces; and three grains to an ounce of water form a good injection in gonorrhœa. *Goulard water*, which is made by mixing a drachm and a half of extract of lead with a pint of water and a tablespoonful of spirit, is much employed as an application in superficial inflammation.

LEAD AND OPIUM WASH.

This is made by mixing one drachm of *sugar of lead*, one drachm of *opium*, and one pint of water. It should be steeped and strained. It is a substitute for the *Goulard water.*

LEPTANDRIN.

Leptandrin is used as a laxative and to act on the liver, and it is also claimed that it has *tonic* properties. It is frequently combined with podophyllin. It is used in dyspepsia, jaundice, and in chills and fever. The dose is from *one to four* grains.

LICE—LOUSINESS.

The skin of man is infested by five kinds of *lice.* The most familiar forms are the *head-louse*, the *body-louse*, and the *crab-louse.* The latter is generally found in the hair around the genital organs.

Lice may cause a disease of the skin, such as *prurigo*, or *itching.*

Head-lice may be destroyed by applying ointments of sulphur, first cutting the hair short.

Body-lice may be destroyed in the same way. The clothing must be destroyed, or boiled or steamed, or in some way exposed to a very high temperature, so as to kill the insects with which it may be infested.

Crab-lice may be treated in the same way as head-lice, or by *mercurial ointment*, or *infusion of tobacco.*

LIME.

Lime-water is prepared in the following manner: "Take of lime half a pound; water twelve pints. Upon the lime, first slaked with a little of the water, pour the remainder of the water, and shake them together. Then immediately cover the vessel, and set it by for three hours; afterwards keep the solution with the remaining lime, in stoppered glass bottles, and when it is to be used take from the clear solution." Lime-water is useful in indigestion attended with acidity at stomach, is sometimes taken in protracted cases of purging (diarrhœa), and in the last stages of dysentery. The dose is one or two pints daily, in milk; ten ounces of it contains only four grains and a half of lime.

Lime-water is employed as an injection in *leucorrhœa* (whites), and is applied as a lotion to indolent ulcers.

The chloride of lime, well known under the name of *Labarraque's disinfecting fluid*, has a powerful effect in decomposing and rendering harmless the putrid effluvia arising either from diseased or decomposing animal matter, and as a disinfecting agent stands unequalled. Hence it is extensively employed for the purpose of purifying sick-rooms, the wards of hospitals, crowded ships, the cells of jails, and in a word, wherever it is necessary to destroy infectious effluvia or to correct offensive odors.

A weak solution of the chloride of lime is much used as a lotion for cancerous or other foul sores.

LITHIA.

This remedy is now considerably used for *rheumatic gout*. It seems to have the effect to reduce the swellings of the joints in this obstinate disease. It is given in doses of *two*, *three*, or four grains in water.

Iodide of lithia ointment is now used with some success as an external application to the inflamed joints in gout and rheumatic gout.

These two remedies—lithia internally, and the ointment of the iodide of lithia externally—seem to be our best remedies for rheumatic gout. It is unnecessary to state that their effects are by no means certain.

LIVER COMPLAINTS.

ACUTE INFLAMMATION OF THE LIVER.

Inflammation may attack the substance of the liver, or may be confined to the peritoneal membrane with which it is covered; but in the great majority of cases both these structures are affected at the same time. The disease commences with a sense of chilliness, or shivering, followed by hot and dry skin, full and hard pulse, thirst, nausea, and generally bilious vomiting. The tongue is white, or coated with yellow fur, and the patient complains of a bitter taste in the mouth; the bowels are generally constipated, though sometimes there is bilious purging; the urine is scanty, high-colored, and deposits a copious brick-colored sediment. Indeed the general symptoms can scarcely be distinguished from those of bilious fever. When the inflammation is deep-seated, and confined to the substance of the liver, the pain is dull; but when it extends to the surface of the organ, or is seated in the peritoneal covering, the pain is then acute, and augmented by coughing, drawing in a full breath, lying on the sound side, or by pressing with the hand under the ribs at the right side, either in front or behind, towards the spine. When to the above symptoms are added jaundice, pain at the top of the right shoulder, and swelling at the region of the liver, this cannot be mistaken for any other disease; but these signs, even in the most severe cases, are sometimes entirely absent.

Acute inflammation of the liver, when not neglected at the beginning, generally ends favorably between the seventh and twelfth day from the commencement of the disease, and is usually followed by bilious purging, a copious sediment in the urine, severe itching of the skin, or bleeding from the nose.

When the inflammation terminates in the formation of an abscess, which is not an uncommon occurrence in warm climates, the pain becomes more acute, and is accompanied with a sensation of throbbing; there is a troublesome dry cough, and in many cases hurried breathing; the pulse, though still full, becomes softer; the palms of the hands are distressingly hot; the sleep is disturbed; fits of shivering, alternating with profuse perspiration, are experienced; and all these symptoms are aggravated towards night. In some cases, as soon as the matter begins to form, all the feverish symptoms abate, and the pain gradually diminishes; but the swelling continues, and the chills or shivering, alternating with perspiration, never fail to be experienced. This termination is generally fatal, either in consequence of the matter remaining confined in the liver, or by the abscess bursting into the cavity of the belly. But it sometimes happens that the abscess points externally, and the aid of the surgeon is required to give vent to the matter; or it bursts spontaneously, and the patient recovers. Sometimes, again, the matter escapes from the body through other channels, and the patient is thus rescued from death

CHRONIC INFLAMMATION OF THE LIVER

Is frequently met with in temperate climates, and is much more common in intertropical countries than the acute form of the disease. It is sometimes a sequence of the latter; but in most cases it comes on gradually, and is at first scarcely noticed by the patient. Pain in the region of the liver is the principal symptom in the chronic as well as in the acute form of the disease; in the former it is dull, heavy, and increased by pressing with the hand over the part, by going quickly up stairs, riding on horseback, and, in fine, by any kind of active exercise; it is also aggravated by lying on the left side, or by any excess in eating or drinking; and in some cases may not be felt during many months, unless under the above or similar circumstances. Cough is only an occasional symptom when the inflammation is acute, whereas the chronic form of the disease is almost invariably accompanied with a short dry cough; and quick walking or any unusual exercise brings on hurried and difficult breathing, and perhaps a fluttering sensation at the heart. The skin and eyes acquire a slightly yellow tinge, the evacuations from the bowels have occasionally a white or clay-colored appearance, indicating a deficiency of the biliary secretion; while at the same time the urine is scanty, high-colored, and deposits a copious sediment; and when the disease is of long standing, the liver is generally observed to be unnaturally large. The symptoms, however, are sometimes so obscure that the only indication of the disease observed by the patient is a dull pain or an uneasy sensation under the ribs at the right side. In many cases the first symptoms noticed are a yellowish color of the skin and of the whites of the eyes; the unnatural appearance of the evacuations from the bowels above mentioned, and the saffron-colored urine, depositing a brick-dust-like sediment. If the right side be examined, the liver will probably be found slightly enlarged, and tender when pressed upon; but when not touched, the patient only experiences an uneasy sensation of weight at the part, and is unabled to sleep when lying on the left side.

The liver is a much-abused organ in various ways. It is worked too much and dosed too much. Nor is this all. It is charged with crimes of which it is not guilty. Nervous dyspepsia is too frequently called *biliousness*. The word *bilious* is very indefinite, and frequently misleads. Probably the *nervous system* is more at fault than the liver in most of the cases of nervous dyspepsia. Those who have a bad taste in their mouth, who are wearied, worn, dyspeptic, and sleepless oftentimes, say that they are bilious when they are really only nervously exhausted. Perhaps the bile may be deficient in quantity or bad in quality; perhaps it may flow into the stomach and cause aversion to food, nausea, and vomiting; but in a great many cases of the so-called biliousness the trouble lies in the *nervous system*. The patient, therefore, does not need to be *purged and pulled down*, but to be *fed and built up*. When they get stronger their fancied biliousness will disappear. This is a subject of great importance, and should be thoroughly understood. Patients who are in this condition of exhaustion should take iron, bark, phosphorus, arsenic, and the like. Every case is a law unto itself, and must be studied by itself.

There are a variety of diseases of the liver which need not here be described in any detail. I may simply give their names: "hobnailed" liver, which is said to be common among drunkards; *fatty degeneration*, *enlargement*, *cancer*, *abscess*, &c.

These diseases can only be made out and studied by a competent physician. *Percussion* (see *Percussion*) is one of the means by which physicians ascertain the condition of the liver.

All that patients can do when they suspect congestion or chronic inflammation of the liver is to take good care of the general health in every way, to use *podophyllin*, *nitro-muriatic acid*, *and dandelion*. Active out-door exercise sometimes works wonders in these cases, especially for those whose occupations are sedentary.

TREATMENT OF INFLAMMATION OF LIVER.

It is next to impossible for one not medically educated to make out correctly an inflammation of the liver as such. It will very likely be confounded with *abscess*, or some other affection.

When we have good reason to believe that the liver is either congested or inflamed, we can cautiously use those remedies that are supposed to act upon that organ. These are:

1. Calomel.
2. Nitro-muriatic acid, from two to five drops in water, several times a day.
3. Dandelion.
4. Leptandrin.

See remarks on these remedies (*Dandelion*, *Leptandrin*).

In abscess of the liver little can be done but sustain and support the system, and let nature do the rest.

A foot-bath composed of three gallons of water, at the temperature of 96°, mixed with two ounces of nitric acid and one ounce of muriatic acid, used every night for half an hour at bedtime, is strongly recommended by several distinguished East Indian medical men; and sponging the body with a wash of the same nature has also been found serviceable.

CHRONIC PAIN AT THE RIGHT SIDE.

Many persons are affected with pain at the region of the liver, which becomes, at times, exceedingly severe, without being accom panied by symptoms of general excitement or swelling. It generally occurs in females; but whether it be of a purely nervous character, or the effect of partial congestion, is not known. This affection, though sometimes very distressing, is not attended with danger. In some instances, after continuing several years, and obstinately resisting every method of treatment, it has gone off entirely, without any perceptible cause. It is more frequently removed by a course of the rust of iron, with aloetic purgatives and regular exercise in the open air, than by local bleeding and mercury.

Torpor of the liver, or deficiency of the biliary secretion, is indicated by the evacuations from the bowels being more or less whitish or clay-colored, by languor and depression of spirits, capricious appetite, impaired digestion, languid pulse, a sluggish state of the bowels, and sometimes giddiness or headache; there may be also a yellowish tinge of the eyes and skin.

LOBELIA (INDIAN TOBACCO).

Lobelia is used as an emetic, and in spasmodic affections and indigestion. It is not used as much now as formerly. The dose of the wine tincture is from *one drachm to two or three ounces.*

LOCALIZED ELECTRIZATION.

This term was first employed by Duchenne to distinguish a method of using electricity in the treatment of disease. It is very successful in *paralysis*, in some forms of *neuralgia*, and in some other affections.

In the treatment of constitutional diseases, like *dyspepsia*, *hysteria*, *hypochondria*, *nervous exhaustion*, &c., *general electrization* is for every reason to be preferred to *localized.* (See *General Electrization.*)

Localized electrization is now very much used both in this country and especially in Europe. It has become known since 1850. (See *Electricity.*)

LOCOMOTOR ATAXY.

This is a name that Duchenne has given to a disease that was formerly confounded with paralysis of the lower limbs. The patient afflicted with it cannot properly control the movements of his legs. He staggers oftentimes like a drunken man. The difficulty may extend to the hands. Sometimes he fails of grasping an object that he aims for. The sight may also be affected. *Sharp piercing pains* are often felt in the limbs.

These are only a few of the general symptoms of this disease. It is not to be expected that any but experienced physicians will be able to make out this disease, or to discriminate between it and common paralysis.

The results of the *treatment* of this disease are not very encouraging. Very few cases recover. This disease is usually caused by degeneration of a portion of the spinal cord.

General electrization is oftentimes of very decided service. (See *General Electrization.*)

Phosphorus, phosphoric acid, and sometimes strychnine have been beneficial. But with all our treatment the disease is a grave one.

LUGOL'S SOLUTION.

This is a preparation of iodine and iodide of potassium. It is used for the same purposes as iodine. The dose is from *five to fifteen* drops in sweetened water.

LUNAR CAUSTIC.

Lunar caustic, or nitrate of silver, has been used internally, in the dose of a quarter of a grain made into a pill with bread-crumb, given three times a day, gradually increased to five grains, in cases of epilepsy, St. Vitus's dance, angina pectoris, and indigestion; but it does not appear to have been attended with much success, and in many cases has produced the effect of imparting a permanent purple or slate color to the skin. Externally a solution of from five to ten grains in an ounce of water has been used with much benefit in cases of irritable ulcers. The mode of applying it is by means of a bit of lint fixed to the end of a probe, or with a hair pencil. A weaker solution is an excellent application in purulent ophthalmia, and is sometimes used as an injection in chronic gonorrhœa. It is employed as a caustic to destroy chancres on their first appearance, and in strictures of the urethra it is frequently applied at the end of a bougie with great advantage. Applied round the inflamed surface in erysipelas, it often has the effect of arresting the progress of the disease.

LUNGS, INFLAMMATION OF.

Inflammation of the lungs (*pneumonia*), like all other inflammatory diseases, is generally ushered in by the usual symptoms of fever. The patient is first attacked with a fit of shivering, which is soon followed by hot skin, flushed face, quick pulse, and the characteristic symptoms of the disease, namely, pain, more or less severe, in some part of the chest, quickened and oppressed breathing, with cough and reddish-colored expectoration. When the substance of the lungs only is inflamed, the pain is dull and heavy, or there is a sensation of heat and weight in the chest without pain ; but in the great majority of cases the pleura, or membrane which envelops the lungs, is also affected, and then a fixed pain, more or less severe, is experienced at a particular part of the chest, which is increased by coughing, or attempting to take in a full breath. Difficulty of breathing is a constant symptom, and is more or less urgent according to the extent or intensity of the inflammation. The respirations in a healthy person vary in number from sixteen to twenty in a minute; but in this disease they are increased to thirty, or even to forty, within the same time. When both sides of the chest are affected, and the inflammation is severe, the anxiety, oppression of the chest, and difficulty of breathing are exceedingly distressing, and the patient feels as if he were about to be stifled ; but in ordinary cases only one lung is affected, and the symptoms are then less urgent. The patient finds the difficulty of breathing increased by lying on the sound side, and therefore remains on the side affected, or on the back, with the shoulders well elevated; the latter is the attitude generally preferred under all circumstances. The expectoration is at first scanty, and composed of a little thin frothy mucus, but in the course of a day or two becomes more copious, exceedingly viscid, and assumes a yellow, reddish, or rusty color, according to the quantity of blood with which it is mixed. The more severe the inflammation is, the more coherent and high-colored is the expectoration, which becomes, when the disease is at its height, so remarkably tenacious, that it adheres to the sides of the vessel even when inverted and shaken in that position. The pulse in most cases is quick and sharp, sometimes hard; there is a peculiarly hot, dry, or parched feeling of the whole surface of the body; the urine is scanty, and very high-colored; and with these are conjoined the other symptoms of fever, namely, thirst, loss of appetite, furred tongue, headache, pain in the loins and extremities, and weakness. Sometimes the brain becomes affected in the course of the disease, causing delirium ; or the stomach, giving rise to nausea, and perhaps vomiting; and not unfrequently the fever, instead of being inflammatory, is of the typhoid form.

The symptoms in favorable cases begin to decline about the fourth day; this change is indicated by the skin becoming more cool and moist; by the cough, which was previously short and dry, becoming loose and less painful; by the expectoration being more abundant, less viscid, and gradually changing from the reddish or rusty tint to a yellowish color; these signs of amelioration being accompanied with a corresponding diminution of the feverish symptoms. Some critical evacuation also usually takes place, such as perspiration, a copious deposit of red or white sediment in the urine, or purging; the first is generally understood to be the most common. The average duration of the disease is from eight to twelve days, but sometimes it is prolonged for a fortnight or three weeks, and followed by tedious convalescence, which is liable to be interrupted by a relapse from any slight cause.

The symptoms which mark an unfavorable termination, are a small, jerking, and rapid pulse, the expectoration being much diminished or altogether suppressed, great frequency of respiration, and a livid appearance of the countenance. Lethargy and delirium also indicate extreme danger.

The symptoms which particularly characterize inflammation of the lungs are the peculiarly pungent heat of the skin at the commencement of the disease, and when further advanced, the orange-red or rusty color of the expectoration, arising from the intimate admixture of blood with the secretion from the bronchial membrane; and its great tenacity, which, as we have already mentioned, does not allow it to be detached from the receiving vessel even when we turn it upside down.

Cold is undoubtedly the most common exciting cause of inflammation of the lungs. This is clearly shown by its prevailing to a much greater extent in winter and spring than in summer, by its frequent occurrence in cold climates, and rare appearance in intertropical countries. *Congestion of the lungs* may be relieved by the application of bran poultices to the chest and back between the shoulder-blades. The poultices may be made of wheat or rye bran. A small bag, containing a pint of bran, may be dipped in hot water and immediately applied. This simple treatment may afford great relief until the physician arrive.

Lung fever may be inflammation of the substance of the lung or of the pleura. In the former case it is called *pneumonia*, in the latter *pleurisy*. The two may exist at the same time.

Physicians now determine these diseases by auscultation (see *Auscultation*) and percussion (see *Percussion* and *Stethoscope*).

It is therefore very important to have good medical advice in all severe and acute inflammations of the lungs, especially as these diseases are frequently fatal.

When no physician is at hand, and the symptoms are such as have been described, the following treatment should be used:

1. Keep the bowels freely open by Epsom salts, or some simple laxative.

2. Give small doses of *ipecac*, one to three grains, every three or four hours. Tartar-emetic and veratrum viride (see *Veratrum Viride*) are used in this disease to reduce the inflammation and lower the pulse.

3. Keep the chest covered by oiled silk. Allow the patient cooling and agreeable drinks, such as lemonade and the effervescing draughts.

In *typhoid* lung fever, when the patient is much exhausted, the system should be sustained by *beef-tea*, *whiskey*, *brandy*, *punches*, *opium*, *and quinine*. (See *Typhoid Fever*, *Treatment of*.)

In *pleurisy* it is necessary to give some diuretic, like *iodide of potassium*, to carry off the fluid that accumulates in the pleural cavity. Blisters are also applied over the affected side with benefit. Sometimes it is necessary to "tap" the chest and drain off the fluid.

LUPULIN (HOPS).

This remedy is given to calm and soothe the nerves, to promote sleep. It is a mild substitute for opium and henbane. It is vastly inferior to bromide of potassium. It may be tried, however, when bromide of potassium fails. The dose is from *one to six grains*.

MAGNESIA.

This substance, from the property it possesses of neutralizing the acid which forms in the stomach, is much used to relieve heartburn. Calcined magnesia is in common use as a purgative, in the dose of a teaspoonful. From the mildness of its action it is more especially useful in cases of piles, stricture of the rectum, &c.; and being also insipid, is well adapted for children. It diminishes the secretion of lithic* acid by the kidneys, and is therefore a useful remedy in *red* gravel, in doses of from twenty to thirty grains twice a day.

Magnesia is the best antidote in cases of poisoning by the mineral acids.

MAGNETISM (ANIMAL). See remarks on this subject under *Rubbing*.

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* "Pertaining to the stone in the bladder. *Lithic acid*, generally called *uric* acid, forms the most common variety of *urinary calculus*."

MANNA.

The dose is from one to two ounces, but it is not to be depended upon as a purgative for adults; hence it is generally used in combination with the infusion of senna leaves, the bitter taste of which it tends in a great measure to conceal. From the mildness of its operation it is well suited for children, in the dose of from ten to sixty grains given in whey.

MEASLES.

Measles generally occurs as an epidemic malady amongst children, but it may attack only a few individuals in a locality, or may affect adults as well as those of tender years.

The symptoms which show that a child is about to be attacked by measles are commonly significant enough. The little patient complains of general heaviness, the eyes are red and watery, and a thin fluid often runs from the nose as from persons affected with a cold in the head; the patient also sneezes frequently. More or less fever now sets in, accompanied in many cases by a very hoarse barking cough, which has often been mistaken for a symptom of croup; the stomach rejects food; the child complains of pains in the limbs or back, and if very young is often attacked by slight convulsions, while older children are in many cases delirious at night. Nothing can be more various than the intensity of these premonitory signs; sometimes the eruption makes its appearance with so little disturbance of the general health, that the patient is not even confined to bed; but in other cases the fever runs extremely high, and great alarm would be excited did we not know that it was the forerunner of an eruptive disease. Towards the end of the third or beginning of the fourth day (but in some cases as late as a week), small red spots, resembling flea-bites, makes their appearance about the face, and then extend over the neck, chest, belly and limbs. The spots are at first separated from one another, but they soon join and form clusters of a horse-shoe shape and dusky red color.

The appearance of the eruption, however, does not, as in the case of small-pox, bring with it much alleviation of the symptoms. The fever, cough, and hoarseness continue or are more severe, and in many instances the whole face is swollen, and the patient complains of violent headache, with difficulty of breathing.

About the third or fourth day after the appearance of the eruption the redness on the face begins to diminish, and it subsides on other parts of the body in the same order as that in which it commenced. When the eruption has completely passed away the scarf-skin comes off in small mealy scales, and some patients at this time experience a most intolerable degree of itching. Finally, about the ninth day the skin is completely free from any sign of the eruptive affection.

Such is the course of measles in its mild or benignant degree; but in many cases the disease does not hold this favorable course. Two things are chiefly to be apprehended during its progress: first, the appearance of nervous, or what were anciently called putrid symptoms; and, second, the occurrence of inflammation of the lungs, by which a very great number of children affected with measles are cut off.

Although, generally speaking, measles is a mild complaint, yet during certain epidemics it assumes a most dangerous character and destroys an immense number of children. The symptoms of the malignant form are, at the commencement, great prostration of strength, anxiety, and tendency to sleep; vomiting and looseness of the bowels; hemorrhages from the nose, stomach, or bowels; violent delirium, and convulsive tremor of the limbs, or general convulsions. The eruption breaks out on the second day, and the fever, with all its attendant symptoms, is aggravated; the eruption rapidly declines, or assumes a livid hue, and is mixed with the blue fever-spots; the delirium now becomes more violent, the convulsions are frequent, and the patient commonly sinks in a state of complete insensibility. This highly dangerous and fatal form is, however, rare, and seldom occurs except during certain epidemics. But children are peculiarly liable to inflammation of the lungs during the decline of the eruption, or within a few days after its disappearance. This occurrence is indicated by a change of color in the face and lips, which assume a purplish hue; the skin becomes very hot and dry; the respiration is oppressed and quick, often rising to sixty or seventy in the minute; the nostrils dilate at each inspiration, and the pulse is excessively quick. The child may or may not cough; but we should never forget that young children may labor under a very severe degree of inflammation of the lungs without either coughing or spitting up any mucus from the chest. Inflammation of the lungs thus attending measles, often lays the foundation of consumption, by which the patients are carried off many months, or even years, after the cure of the original disease.

In some cases the eruption suddenly disappears from the face and body. The sudden subsidence of the eruption is in itself a matter of little consequence; it becomes, however, one of much importance, because it generally depends on, or at least is connected with, an inflammatory condition of the lung, intestines, brain, or some other internal organ.

Treatment.—In an ordinary attack of measles we have little more to do than keep the child in bed, administer any mild laxative medicine, so as to keep the bowels open, and give cooling drinks. The disease must run its course; and unless untoward accidents arise, the patient will, generally speaking, get well through the aid of nature in twelve or fifteen days.

Measles, as all know, is a very contagious affection. There are those who have had two attacks. A case is reported of a family, when, after all the children were successively attacked, *the disease again attacked the one who first had it.*

The course of treatment is usually very simple indeed, even for the quite severe cases:

1. Keep the skin open with the following mixture:

Syrup of ipecac,
Syrup of squills, equal parts.
Dose a teaspoonful every three or four hours.

2. Give cooling and agreeable drinks; *lemonade* and *hard cider* are both excellent. Let the taste of the patient decide which to have.

3. *Tonics and nourishing food.*

This treatment is only necessary for the cases that are followed by debility.

It is not necessary to use many *expectorant remedies. They are all uncertain in their action, and are very apt to disturb the stomach.*

Care should be taken to prevent the patient *from taking cold.*

It is therefore not well to expose one's self very soon after recovery.

Measles leaves the eyes in a weak condition, therefore it is necessary to take especial care that the patient does not begin to read or to sew during convalescence. There are many who seriously and permanently injure their eyes by beginning to use them too early and too often when convalescing from measles.

Another bad result that measles sometimes leaves behind it is deafness, with discharge from the ear. The inflammation of the throat extends into the middle ear and causes ulceration. To avoid this danger the throat should be frequently gargled, if the patient is old enough to gargle, with solutions of chlorate of potash and water—one drachm of chlorate of potash to one ounce of water. The same solution may be snuffed up the nostrils three or four times a day during convalescence.

When the eruption suddenly disappears, we must not conclude that this is necessarily a sign of weakness, and commence at once with wine or other stimulating fluids. On the contrary, it will be more prudent to endeavor to ascertain whether this may not depend, as has already been mentioned, upon some internal inflammation; but if the disappearance seem to be connected with a general state of weakness, or to have occurred without any apparent cause, then we may give small quantities of wine and water, but with very great caution, or administer the *carbonate of ammonia* in the following manner:

Sub-carbonate of ammonia, six grains,
Camphor, three grains,
White sugar, three scruples. Divide into three powders; one to be taken every second hour.

MENSTRUATION.

The periodical discharge of females termed menstruation indicates the power of procreation, and when regular and in due quantity serves not only as a sign of health, but as a powerful means of preserving it. This discharge appears intended to relieve the system of the blood which is destined for the support of the fœtus during pregnancy, as well as for the secretion of milk, the natural aliment of the child during the first months of its existence; and has also the effect of stimulating the womb, and fitting it for conception. If, therefore, the superabundant blood which is intended by nature to be discharged through the medium of the womb, be retained in the system, it must accumulate in other important organs, or tend to deprave the whole mass of blood in circulation, and thus induce local disease or general derangement of the health; and if, on the other hand, the discharge be much greater, or occur more frequently than natural, the body will be weakened, and the health otherwise injured. Hence, from the great influence which menstruation must necessarily exercise over the whole system, it is obvious that perfect health cannot be maintained while there is any irregularity or disorder of this important function.

A delicate and luxurious manner of living, early excitement of the imagination, want of suitable exercise in the open air, sleeping upon down beds, late rising, and, in a word, mismanagement or neglect of the moral or physical education of girls, tend strongly to induce precocious menstruation. The non-appearance of the discharge before the age of seventeen, or even later, is more desirable than its premature occurrence; the latter, however, is not to be considered as a disease in itself, although it generally indicates a feeble constitution.

Young women are often late in menstruation, and this sometimes becomes a source of much anxiety to parents; but although it be delayed considerably beyond the fourteenth year, there is no occasion for alarm as long as the usual signs of puberty are absent. In this case we are not anthorized to adopt means for the purpose of hastening menstruation, nor should we be justified in attempting to remove the various ailments to which girls are subject at this period of life, by administering remedies to bring on the menstrual flux. But on the other hand, when, at the usual age of puberty, pain is experienced from time to time at the loins and in the abdomen, with an unusual development or painful sensation of tension of the breasts, a periodical swelling at the lower part of the belly, and other symptoms indicating that the system is making fruitless attempts to establish menstruation, it then becomes necessary to adopt means to aid the efforts of nature, in order to prevent the serious consequences which might result from retention of this salutary evacuation. But we are not to interfere more than is really necessary. When medical aid is really required, the remedies to be employed must depend greatly upon circumstances. If the girl be full-blooded and of a robust constitution, and if, at the period when the symptoms above enumerated are experienced, she complain of headache, while at the same time the pulse is full, the face flushed, and other symptoms are present, indicating an excess of action, the bowels should be mildly acted on by cooling purgatives every second or third day; and the diet must be mild and carefully regulated, and stimulants of every description entirely abstained from.

An opposite state of the system, approaching to chlorosis (green sickness), occurs much more frequently than the plethoric state above described. In this case the patient becomes pale, languid, emaciated, loses strength, and is easily fatigued; the pulse is feeble, the bowels are constipated, and she complains of being unable to keep her feet warm. The treatment indicated in the last case was to lower the plethoric patient to a state favorable to menstruation; here, on the contrary, we must endeavor to raise the patient to the same state by tonic and strengthening remedies. Of this class of medicines, preparations of iron hold the first rank in all menstrual disorders. From ten to fifteen drops of the *tincture of chloride of iron* in a little water should be taken regularly three times a day, and the bowels are to be kept open by some aloetic aperient.

The hip-bath and foot-bath should also be frequently used; the water at first ought to be about the temperature of a hundred de grees of Fahrenheit's thermometer, and afterwards gradually increased until it be as hot as the patient can bear.

The strength must be supported by generous diet. Frequent friction of the lower extremities with the flesh-brush or horse-hair glove is serviceable; and instead of depressing the girl's spirits by confining her to the house, and treating her as if she were laboring under a serious illness, she ought to be allowed to enjoy the benefit of change of air to the sea-coast, plenty of exercise in the open air, particularly on horseback, dancing, and the society of agreeable companions. Every care should be bestowed to render her cheerful and happy.

In general, the duration and quantity of the first discharges are not to the same extent as when menstruation is fully established; and it often happens that two or three months elapse between the first and second discharge, and sometimes the menses do not appear at regular periods until the expiration of a year or two.

It is of the greatest importance that young women should be instructed *early* by their female friends in the management of themselves during menstruation. Exposure to cold, dancing, and all kinds of active exercise, food difficult of digestion, bathing, medicines, particularly emetics and purgatives, mental excitement, and other causes which might check the discharge, ought to be carefully avoided at this period.

Even in the most healthy women menstruation occasions a general disturbance of the system that cannot be entirely disregarded with impunity. There is peril in exposure or exertion at that time which might be perfectly harmless during the interval; and thousands of suffering and feeble women date their troubles from slight indiscretions at this critical period. The daily routine of ordinary duties may often be performed with little or no discomfort, but it is always of the greatest importance to guard against any exertion that fatigues either mind or body. Those who suffer from irregular or painful menstruation should be especially careful of themselves, not only during their sickness, but for two or three days before and after. Much may be lost and nothing can be gained by taxing the energies to their utmost, when nature imperatively demands repose.

CHLOROSIS.

A characteristic symptom of chlorosis is a pale yellowish-green complexion; hence it is commonly called *green-sickness.*

Chlorosis is always a chronic disorder, and commences slowly. The patient is at first languid and listless, disinclined to amuse herself as usual, and is easily fatigued by ordinary mental or bodily occupation; her face gradually becomes pale, and the skin assumes a sallow appearance; the bowels are constipated; she loses her appetite, and has sometimes an unnatural craving for certain articles of food; the tongue is white, the breath fetid; and if menstruation has been already established, the discharge loses its red color, and diminishes in quantity until it no longer appears.

In the confirmed state of the disease there is often considerable emaciation; the flesh loses its firmness; the lips, tongue, gums, and inside of the mouth are unnaturally pale or whitish; slight swelling in the eyelids and face is observed in the morning, this wears off during the day, and at night the feet or ankles are swollen; the urine is pale and limpid; the belly is frequently enlarged from flatulency, particularly after eating; there is sometimes nausea or vomiting in the morning, heartburn, and other symptoms of indigestion. The appetite is in many cases morbidly capricious. Sometimes there is a craving desire to eat pickles, chalk, lime, pipeclay, cinders, &c. The shortness of breathing, which in the first stage was only slight, is now exceedingly oppressive, and accompanied with palpitation of the heart on ascending the stairs, attempting to walk quickly, &c. The pulse is feeble and small, there is great difficulty in keeping the feet warm; sometimes there is cough, periodical headache, and a variety of nervous or hysterical symptoms.

Causes.—Females of the lymphatic temperament and of weak constitution are most frequently attacked with chlorosis. It is developed under various debilitating causes, as frequent exposure to a cold moist atmosphere, watery or poor diet, more especially when conjoined with fatigue and long watching, the various depressing passions, as grief, unrequited love, &c.

This disease seldom proves fatal; but, when left to itself, or badly treated, it may be prolonged during many months, or even years, and may leave traces of its injurious effects on the constitution in after life.

Treatment.—There is no disease in which the administration of iron, in some of its many forms, is attended with such uniformly favorable results. The tincture of chloride of iron should be taken in doses of fifteen drops three times a day, about half an hour before each meal; the diet must be nourishing, as fresh meat and bread, and easy of digestion. The patient should walk out in the air and sunlight, take plenty of sleep, and frequently sponge the body off and rub thoroughly dry with a coarse towel. Care is necessary, however, to avoid attempting too much at first. The bowels are to be regulated before beginning a tonic course, and the stomach must be gradually accustomed to the medicine. Exercise, too, must be carefully regulated according to the patient's strength, and increased by slow degrees as health returns: (See *Women, Diseases of.*)

SUPPRESSION OF THE MENSES.

Women in the full enjoyment of health may have the discharge arrested suddenly, from exposure to cold, sudden fright, or any strong mental emotion. In this case there are headache, pain in the limbs, back and loins, full frequent pulse, and other symptoms of fever. The foot-bath is to be used as early as possible, or the patient may sit with the lower part of the body immersed in a tub of water, at the temperature of one hundred degrees, for twenty minutes or half an hour, and after being carefully wiped dry, she is to be well wrapped up and placed in a warm bed. Two or three of the *pills of rhubarb and aloes* are to be taken every three or four hours, until the bowels are freely opened; and, to promote perspiration, eight or ten grains of *Dover's powder* may be given every six hours, until three or more doses are taken. This treatment, conjoined with light nourishing diet, or abstinence, if the feverish symptoms run high, seldom fails to bring back the discharge. But if the patient be neglected, or if the treatment adopted fail to produce the desired effect, the menses may not appear at the next expected period, and the suppression becomes chronic. In many cases, again, the obstruction is the result of general bad health, and comes on slowly; the discharge either gradually diminishing in quantity or appearing at unusually protracted intervals, until at length it ceases entirely. The health for the first month or two may not suffer materially, but the important function of menstruation cannot be long suspended without producing a series of morbid symptoms. The balance of the circulation may be deranged, and determination of blood to different organs may take place, and give rise to hemorrhage (discharge of blood) from the lungs, stomach, bowels, or nose. The latter occurs most frequently, and is a salutary effort of nature to relieve the patient. The digestive organs frequently suffer, the tongue becomes foul, the appetite impaired, and the bowels constipated, or otherwise disordered. The lower part of the abdomen is at times swollen and painful, and the breasts are sometimes tense and tender, or painful when pressed upon. Many women are troubled with various nervous diseases, as hysterics, spasms, &c., while the menses are obstructed, and recover entirely when the healthy function of the womb is restored.

In the treatment of chronic suppression of the menses, we must in the first instance endeavor to restore the general health. If there be a greater inclination to sleep than is compatible with health, lassitude, occasional giddiness, and a sensation of fulness or weight in the head, full pulse, an overcharged state of the veins, a more or less turgid appearance of the countenance, suffusion of the eyes, slight palpitation of the heart, and other symptoms indicating plethora, or repletion of the blood-vessels, the bowels are to be kept freely open, and spare diet, abstinence from wine or malt liquor, early rising, and regular exercise in the open air, must be strictly enjoined. When by these or other means suited to the circumstances of the case, the system is sufficiently lowered and the general health improved, the menstrual flux will probably return without the assistance of remedies which are understood to exercise a specific influence on the womb; but if the discharge fail to appear, we must then have recourse to *preparations of iron;* and at the period when the patient feels as if she were about to be unwell, the *hip-bath*, and the *application of hot fomentations* to the lower part of the belly, are to be repeatedly employed. The repeated application of mustard poultices to the breasts has been known to bring back the menses after they had been a long time suppressed. But it must be kept in mind that these remedies are *only to be used at the periods when the menses ought to appear, or when they seem disposed to flow;* and if there be no symptoms to indicate these periods, they should be employed during three or four days every month, for four or five months in succession, or longer if necessary; the regimen and diet, as above directed, being strictly followed during the intervals.

No one is justified in administering remedies with the intention of bringing back the menses, without being satisfied that the suppression is not the result of pregnancy. To neglect this precaution, or to mistake the natural for a morbid suspension of the discharge, might lead to the most serious consequences. It should also be borne in mind that suppression of the menses is more frequently the effect of other diseases than a disease of itself; when merely symptomatic, the principal indication is to remove the disorder on which it depends; but at the same time we should not neglect to use the necessary means to restore the healthy functions of the womb, because the absence of the menstrual discharge always increases any disorder with which it may be complicated. In all cases of this description, however, it would be improper to use medicines internally, with the intention of stimulating the womb, inasmuch as this effect cannot be produced without at the same time exciting the diseased organ on which the suppression depends; and we must therefore trust to diet, leeching, the warm hip-bath, and other local means above prescribed, conjoined with treatment suited to the principal disease.

PAINFUL MENSTRUATION.

This is a very common disorder, and is a source of great suffering to many women. Two or three days before the discharge appears, the patient complains of pain in the back, loins, and lower part of the belly, irritation of the stomach, constipation of the bowels, general uneasiness and irritability of temper. The latter symptom, however, is not constant. The discharge comes away at first in drops, accompanied with increased suffering. The pain extends from the loins and lower part of the abdomen to the hips and thighs. The belly may be swollen from flatulency. Sometimes there is considerable pain and difficulty in voiding urine, or it is altogether suppressed during the first day or at the time the symptoms are most urgent. The pain is not constant, is much more severe at one time than another, and generally ceases with the discharge, which is generally scanty, although it may continue to flow three or four days, or even longer. At the commencement of the disorder the patient may experience pain only during the first day of the discharge, but the suffering gradually becomes more severe and of longer duration, until at last from eight to fifteen days of every month are passed in this manner; the general health, spirits, and vigor decline, and after many years of unceasing bodily or mental distress, at one period suffering acute pain, at another dreading its approach, the constant irritation of the system, which has been unavoidably kept up, frequently induces consumption, organic disease of the womb, or some other fatal disorder, and the patient is carried off.

Treatment.—The warm hip-bath should be employed three or four times daily; this has considerable effect in increasing the discharge, and mitigating the pain; and the bowels are to be kept open by mild laxatives. In general it is found necessary to administer *opium*, in the dose of one or two grains, every four or five hours, or at longer intervals, according to the circumstances of each particular case; or three grains may be passed up the rectum. When symptoms of hysteria are present, *assafœtida* should be combined with the opium; and if the belly be much distended, an enema (injection to the bowels) of a solution of the former remedy seldom fails in removing the flatulence.

Some preparation of iron should be given during the intervals. If the patient be of scrofulous habit of body, the *iodide of iron* is to be preferred; if it produce slight nausea, giddiness, and headache, the dose should be diminished, or the medicine altogether discontinued for a time.

Immoderate flowing of the menses cannot last long without the patient experiencing a variety of symptoms arising from deficiency of blood in the system. She gradually loses strength, and becomes exceedingly languid; the breathing is hurried on any ordinary exertion; the face is pale and contracted, or may appear bloated and fuller than natural, and there is a livid circle round the eyes; the appetite is greatly impaired; the bowels are constipated; and at night the feet and ankles are swollen. Symptoms indicating a deficiency of blood in the brain are often superadded to these; headache, giddiness, and ringing in the ears are complained of; there is considerable nervous irritability, the patient being disturbed by the slightest noise; the pulse is quick, weak, and easily excited; and palpitation or fluttering at the heart is brought on by slight exertion.

EXCESSIVE MENSTRUATION.

Some women menstruate much more freely than others, and yet enjoy perfect health. But when, in any individual case, the menstrual discharge lasts longer than usual, or, lasting the usual time, is remarkably profuse in quantity, the condition is one significant of some disease. It may be that there is an impaired condition of the blood, or some disorder of the circulation; or there may be disease of the uterus itself, or the surrounding organs. Profuse menstruation occurs when the system is plethoric, and also when it is debilitated and relaxed. One of the worst causes of this menstrual irregularity is excessive matrimonial indulgence, which induces an irritable and congested state of the uterus and its appendages. Entire abstinence in this respect is essential in the management of the disorder under consideration.

The treatment must of course be varied according to the condition of the patient and the cause of the disease. If that cause be debility, the chief attention must be directed to the restoration of health by tonics, nourishment, exercise and fresh air. Iron will be found of service in this condition. Cold hip-baths, and vigorous rubbing of the skin with coarse towels, will aid in restoring the circulation, care being taken at all times to keep the feet and limbs comfortably warm.

If the patient is of full and robust habit, a different course of treatment will be required. The bowels must then be kept freely open by saline aperients, the diet must be sparing, and all stimulants, even coffee, avoided.

Excessive menstruation is often a symptom of uterine disease; it may be of tumors within or without the cavity of the womb, &c., in which case it will be impossible for an inexperienced person to form any satisfactory opinion of the case, or to distinguish between an excessive discharge at the menstrual period, and bleeding from some cause independent of menstruation. Skilled advice should be sought in all cases of doubt, since prolonged uterine hemorrhage, from any cause, is always accompanied by danger.

The immediate treatment during a profuse flow consists in keeping the patient perfectly quiet upon her back, and the application of cold water by means of towels to the lower part of the bowels and to the bleeding parts. Cold and acid drinks should be given, and all hot drinks, even tea, strictly prohibited. The room should be cool and quiet, conversation with the patient avoided, and an opiate administered to calm the nervous system. If these simple measures do not speedily check the flow, no time should be lost in obtaining competent medical advice, as it may be necessary to make applications directly to the womb, or even to plug the vagina firmly with cotton.

CESSATION OF THE MONTHLY DISCHARGE.

The cessation of the menses being a natural process, and not a disease in itself, we may safely leave nature to accomplish this salutary change in the system, and should carefully avoid interfering, unless sympfoms occur to authorize the employment of remedial measures. The treatment in ordinary cases consists in attention to diet, which should be light, nourishing, and easy of digestion; in regular exercise in the open air, care being taken to avoid exposure to cold or damp; in wearing warm clothing, and paying great attention to keep the feet warm; in the occasional administration of *castor-oil*, or any other mild medicine, if the state of the bowels require the aid of laxatives; and in keeping the mind tranquil.

Various symptoms occasionally occur which lead women to believe themselves pregnant: besides the absence of the discharge at the usual monthly periods, the breasts become enlarged, tender, and sometimes painful; the belly is gradually distended from flatulence collected in the bowels, and there is sickness, and sometimes vomiting in the morning; but these symptoms may easily be relieved by means of the usual remedies for expelling flatulence, viz. purgatives and active exercise.

MERCURY.

BLUE PILL AND CALOMEL,

In small and frequently repeated doses, are the preparations principally employed in various chronic disorders, in order to check or alter diseased action; hence they are called alteratives; and from the influence which they exercise on all the secreting organs of the body, certainly constitute the most effective remedies of this class.

CORROSIVE SUBLIMATE

Is seldom used internally. A useful gargle for syphilitic sores in the throat is composed of three or four grains of this mercurial dissolved in a pound of barley-water, with the addition of two ounces of honey of roses; and one grain to three or four ounces of water forms a serviceable lotion for ulcerations, or specks on the cornea or anterior part of the globe of the eye.

PLUMMER'S PILL,

Which is composed of one grain of calomel, one grain of the golden sulphuret of antimony, and two grains of gum-guaiac, has been long celebrated as an alterative remedy in a variety of diseases, especially chronic affections of the skin, chronic rheumatism, and syphilitic eruptions; it is also of great service in the cure of obstinate ulcers, connected with general derangement of the health.

MERCURY WITH CHALK

Is the mildest preparation of mercury; hence it is often used in many of the complaints of children. It acts less on the stomach and bowels than other mercurials, and is therefore frequently prescribed when calomel and blue pill cannot be borne. The dose for an adult is from five grains to a scruple.

MERCURIAL OINTMENT

Rubbed into the skin produces the same effect on the system as other preparations of mercury taken internally; hence this is the most eligible method of inducing salivation when the digestive organs are too irritable to bear calomel or blue pill. Half a drachm to a drachm, rubbed in night and morning on the inside of the thighs, is the quantity used; but when it is necessary to produce a speedy effect, the same quantity may be employed every hour. The warm bath occasionally favors the absorption of the mercury. This ointment is also used as a dressing to syphilitic sores, to destroy insects on the skin, and, combined with camphor (by way of friction). to reduce various kinds of chronic tumors.

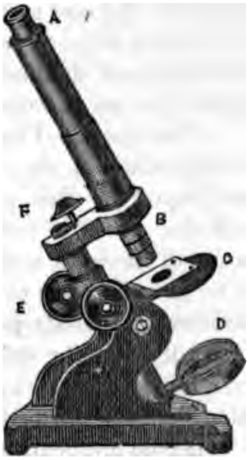
MICROSCOPE.

The microscope is an instrument that is now quite familiar to many who know little or nothing of the science of medicine.

The accompanying cut (see cut) represents one of the more common forms of microscope. The tube A, B contains the lenses. Those at A form the *eye*-piece, and those at B the *object*-glasses. The specimens to be examined are put on C, on which the mirror D throws the light. The apparatus is adjusted at F and E.

Some microscopes have three eye-pieces, several object-glasses. Microscopes magnify in all directions, and *many thousand times* the measurement of the object examined.

The microscope has wrought a great revolution in the science of medicine. It has given a new impetus to the study of disease, and has really created an era in science.



It informs us of the constitution of the blood, of the bones, and of the various tissues, secretions, and excretions of the body in health and in disease. By its aid we can distinguish the mucous secretions of the urethra, the bladder, the mouth, and the vagina. By its aid we can detect in the spermatic fluid the presence or absence of spermatozoa. By its aid we can determine the existence of that most serious affection of the kidneys—Bright's disease. (See *Bright's Disease.*) By its aid we can study a large number of diseases of the brain and spinal cord, of which without it we could know little or nothing. By its aid we can determine the internal structure of tumors, and decide in regard to the probabilities of life or death with those who suffer from them. By its aid we can detect the stains of blood, and thus help to convict the guilty criminal, or acquit the innocent. By its aid we now know, or think we know, the mysterious sources of many of our most terrible diseases; that ague is caused by a spore in the atmosphere, and that a large number of our fevers are transmitted by the same agency; that the water we drink and the air we breathe are always filled with animalcules and fungi, in number and variety past comprehension. By its aid we have recently solved the mystery of that loathsome disease trichinosis (see *Trichiniasis*), and discovered that the worm found in the flesh of the hog is propagated by millions in the muscles of those who carelessly eat it uncooked or underdone. And yet microscopic science is yet in its infancy. Its proudest triumphs are yet in the future.

MILK ABSCESS.

Inflammation may attack both the breasts at the same time, but is generally confined to one only; and it often happens that after one is healed the other becomes inflamed. The acute form of this affection usually commences three or four days after delivery; the breast becomes hot, painful, swollen, hard, and red at particular parts, or over its whole surface. The local symptoms are accompanied with fever, which is more or less severe according to the extent and intensity of the inflammation. Sometimes the pain becomes excruciating, and is increased by the slightest movement; the patient is deprived of sleep; the whole breast is enlarged, and the swelling and pain even extend to the arm-pit. In some cases the breast acquires a lobulated or knotted appearance, as if there were several distinct tumors. This disease requires *prompt* treatment, lest an abscess form, producing a "broken breast."

Treatment.—The first indication is to prevent the inflammation terminating in the formation of matter. But the means usually employed for this purpose are not likely to be successful unless resorted to at a very early stage; and in numerous instances, in spite of the most active remedies, suppuration cannot be prevented. The bowels ought to be freely acted upon by repeated doses of *Epsom salts*, *Seidlitz powders*, or any other cooling saline purgative. Low diet is to be strictly enjoined; and the breasts are to be drawn at proper intervals by means of the breast glass or pump, this operation being performed as gently as possible.

If cold applications increase the patient's suffering, warm linseed or bread poultices are to be substituted; or the well-known popular mode of applying warmth, called by nurses "bowling the breast," may be employed. A wooden bowl, well heated by immersion in boiling water, is to be wiped dry, and the breast, being properly protected by flannel, is then to be placed in it, and supported by a suitable bandage. The dish retains the heat a considerable time, and thus an equal degree of warmth is constantly applied, under the soothing influence of which the milk often flows copiously, to the great relief of the patient.

To moderate the feverish symptoms and alleviate the pain, the subjoined draught may be given every four hours:

> Mindererus' spirit, three drachms,
> Solution of the acetate of morphine, from five to eight drops,
> Water, sweetened with a little sugar, two ounces. Mix.

MILK FEVER.

It frequently happens that women are affected, on the third day after delivery, with headache and feverish symptoms, generally preceded by slight shivering or a sensation of chilliness; the skin becomes hot, the pulse full and quick, the tongue dry, with considerable thirst, and the breasts are turgid, and tender or painful.

To counteract this state of febrile excitement, the child ought to be applied to the breasts at an early period after delivery, and this should be done repeatedly until the milk begins to flow. On the third morning a mild dose of castor-oil (half an ounce), lenitive electuary, or rhubarb and magnesia, should be taken; but cooling saline purgatives are to be preferred if there be a tendency to fever.

If the breasts become much distended with milk, and if relief be not afforded by frequently putting the child to them, it will then be advisable to draw off two or three spoonfuls of the milk by means of a breast-glass or pump.

To subdue the feverish symptoms, two scruples or more of nitre dissolved in barley-water may be given in the course of the day; the bowels are to be pretty freely acted upon by laxative draughts, as above directed; and low diet must be strictly enjoined.

MINDERERUS' SPIRIT.

Mindererus' spirit, or solution of the acetate of ammonia, is much employed as a sudorific, *i.e.* a medicine producing sweat. It promotes perspiration, without quickening the circulation, or increasing the heat of the body; hence it is given in fever, acute rheumatism, and other inflammatory disorders, where stimulating sudorifics are inadmissible. The dose is one or two tablespoonfuls every two or three hours, warm barley-water or some other mild beverage being taken freely to promote its operation. It is usually taken in combination with nitre and the preparations of antimony.

MISCARRIAGE AND ABORTION.

The expulsion of the child from the womb at any time between the seventh month and the full term of utero-gestation is called *premature labor;* and when the fœtus is expelled before the seventh month the process is called *miscarriage* or *abortion*. In the latter case the fœtus is either already dead, or its different organs are not sufficiently developed to admit of life being sustained.

So many circumstances in life act as occasional causes of miscarriage, that the limits of this work will only allow us to notice some of the principal of them, among which may be mentioned various mental emotions, as sudden fright, anger, joy, disappointment, and distress of mind from whatever cause; violent coughing, excessive purging or constipation of the bowels, profuse blood-letting, falls, blows, sea-sickness, the extraction of a tooth, and the various causes which excite undue determination of blood to the womb, as over-exertion in walking, riding, or dancing, errors in diet, and immoderate sexual indulgence.

Some women are so constituted that any of the above-mentioned causes may readily induce miscarriage, whereas in others it cannot be brought on by the strongest moral or physical causes. Numerous cases are recorded of violent means having been unsuccessfully employed to procure abortion; and it cannot be too generally known that even where these criminal measures do succeed, it is often at the expense of the woman's life. The symptoms preceding or accompanying miscarriage vary according to the period of pregnancy at which it occurs; during the first two months the embryo or fœtus is discharged without pain or much loss of blood, and it often happens at this early stage that the woman is not aware she has miscarried, and attributes the discharge to the return of the menses. At a later period the death of the fœtus is announced by great depression of strength and spirits, palpitation of the heart, paleness of the countenance, fetid breath, a sensation of coldness and weight at the lower part of the belly, mucous discharge from the genital organs; sometimes there is frequent desire to void urine, and after the middle of the fifth month the movements of the child cease to be felt. These signs are followed by more or less profuse flooding, and clots of coagulated blood may be observed, which serve to distinguish this discharge from that of the healthy menstrual fluid, which never coagulates. The flooding is accompanied with acute pain, extending from the navel to the genitals; and bearing-down pains, resembling those of regular labor, are occasionally felt. At last the fœtus comes away, and is generally enveloped in its membranes when the accident occurs before the third month of pregnancy; in the following months the membranous bag containing the fœtus bursts, and the waters are immediately discharged; then the fœtus comes away, and finally the after-birth.

Sometimes symptoms threatening abortion continue during two or three days; the woman is first attacked with rigors or shiverings; shortly afterwards the pulse becomes quick and full, the skin hot with thirst, and other signs of general excitement, accompanied by a sensation of weight and fulness at the lower part of the belly and loins, followed by discharge of blood from the womb in larger or smaller quantity, with pains at intervals resembling those which take place at the commencement of natural labor. When such symptoms are manifested miscarriage is very likely to occur, yet by timely and judicious treatment this accident may be averted, the bearing-down pains may be suspended, and the flooding checked, and the womb may retain the child until the full period. But when the mouth and neck of the womb soften, and the bag of waters begins to protrude, while the discharge and contractile pains continue, all our efforts to prevent miscarriage will be fruitless.

Miscarriage takes place most frequently during the first three months of pregnancy; when it happens in consequence of the gradual decay and death of the fœtus, which is by far the most common cause, it is less dangerous than when it occurs suddenly from accidental or violent causes; under all circumstances, the danger increases with the advance of pregnancy. Sometimes the after-birth is retained for several weeks after the fœtus has been expelled, becomes putrid, and is discharged in detached pieces; or it may remain during several months, and then be thrown off in a shrivelled or partially dried state, or in the form of a fleshy mass.

Treatment.—When, from the symptoms above mentioned, we have reason to believe that the fœtus is dead, it would be useless to attempt preventing miscarriage; but if signs of plethora (fulness of blood) and general excitement be manifested, together with the local premonitory symptoms already noticed, we then have it greatly in our power to ward off the threatened accident, and this may even be effected after flooding and irregular pains have been experienced; but if the waters be discharged, miscarriage is inevitable. In all cases, but more especially where the woman is nervous and of an irritable temperament, it is advisable to administer an opiate (half a grain of *morphine*, or fifteen drops of *laudanum*) immediately after the bleeding, in order to allay the bearing-down pains or contractions of the womb. The diet should consist of light farinaceous food, as arrow-root, sago, toasted bread, &c.; and lemonade, soda-water, or any other cool beverage may be drank freely. But the most essential part of the treatment, without which neither the above nor any other means are likely to be of much service, is mental and bodily quietude. This must be strictly attended to from the time that premonitory symptoms make their appearance until all danger is past. The apartment should be large and well-aired, and the patient should lie on a mattress or couch, with the body lightly covered. In the event of flooding coming on, cold applications are to be assiduously employed, as before directed, until the discharge is arrested. When the *pains* and flooding have ceased, a little *castor-oil*, with from ten to fifteen drops of *laudanum*, or a mild dose of *rhubarb* and *magnesia*, may be given to act gently on the bowels.

When all our efforts to prevent miscarriage prove ineffectual, and the fœtus is expelled, while the after-birth is retained in the womb and the flooding continues, the *ergot of rye*, or plugging the vagina, in the manner recommended under the head of *Flooding*, should be employed; or the *acetate of lead*, which has a powerful effect in subduing hemorrhage, may be administered.

The cold hip-bath, or sponging the lower extremities and lower part of the belly with cold vinegar and water, strict attention to diet, moderate but regular exercise, cooling saline laxatives, and abstaining from conjugal intercourse during the first five months of pregnancy, will be found the best preventives of miscarriage.

Women who have once miscarried should be especially careful of themselves at the time corresponding to the menstrual period, and for two or three days before and after. The recumbent position should be maintained at such times, and the diet should be moderate. Hot drinks of all kinds must be avoided.

MONSEL'S SOLUTION (OR SOLUTION OF PERSULPHATE OF IRON).

This is our best agent for arresting the flow of blood from a wound. It may be applied directly to the bleeding orifice. It is hardly necessary to state that, when a large artery has been opened, *pressure* must be used in addition to our other applications.

MORTIFICATION.

The appearances of a mortified part are very striking, and when once seen can seldom be mistaken afterwards. They are best observed in cases of mortification from cold, or in that peculiar form of the disease which often attacks the extremities of old people

The parts so affected lose gradually all feeling, the natural heat is also lost, and the mortified portion of the body or limb becomes quite cold; it is of a brown, livid or black color: decomposition now takes place sooner or later; the scarf-skin is raised up in little tumors from the gas which is disengaged by the decomposing flesh; a very offensive odor is emitted, and any discharge which may accompany the mortification is of a highly fetid kind. The dead part is now either removed from the body by a natural process, or excites a species of low fever, which eventually terminates in death.

It should, however, be remarked that in many cases mortification is not so complete as we have just described it to be; but is preceded by what medical men call *gangrene*. Here the parts are not completely dead, but are more or less rapidly approaching to a state of mortification; the powers of life in the part are much diminished, but not quite extinct; some feeling still remains, and the blood circulates in some of the vessels.

Causes and Symptoms.—One of the most frequent causes of mortification is unquestionably inflammation. When certain parts of the body are violently inflamed (more especially if the inflammation be of an erysipelatous kind) they are subject to partial or complete mortification, and this is the more to be dreaded in persons of dissipated habits, or those whose health is reduced by poor food, bad air, and irregular modes of life. When mortification is about to take place we generally find that the pain and fever which accompanied the inflammation suddenly diminish or altogether subside; the affected part gets soft, and loses its natural heat and feeling, while at the same time it assumes a dark or livid color; the scarf-skin soon becomes separated from the true skin underneath, and sometimes vesicles filled with fluid, and resembling small blisters, appear on different points of the mortified surface. Our description is confined to mortification of *external* parts, for when any of the internal organs are attacked by mortification, the case is altogether beyond the reach of medicine.

The life of any portion of the body cannot be sustained without a due supply of blood and nervous power; hence any cause which suspends or interrupts this supply may excite mortification. Thus long-continued pressure will often occasion mortification, as we frequently see in cases of typhus fever, &c. Cold, also, is often another cause; and people should always remember that when parts which have been frost-bitten or frozen are suddenly warmed, they are very apt to be attacked by gangrene and mortification.

Treatment.—When the inflammatory symptoms have been removed, or when from the beginning the mortification is attended with low nervous fever, and the patient seems to be sinking under the disease, it will be absolutely necessary to support his strength by a mild, nourishing diet, by stimulants and tonics, and by cordials. The best cordial, perhaps, which we can give is a wine-glassful of Sherry or Madeira wine, every four hours or oftener, according to the necessities of the case.

As in many cases of mortification, the pain, restlessness, and anxiety of the patient are distressing, we must endeavor to mitigate the pain and relieve the suffering by opiate medicines. These may be combined with the quinine, if the latter be given, or with a few grains of nitrate of potash or camphor. As it has been proved that in many cases opium produces a stimulating effect, it will be more prudent to administer half a grain of the acetate of morphia every five or six hours.

However, in the peculiar species of mortification which attacks the toes and feet of old people, we may give one grain of solid opium every three or four hours with advantage.

The *local* treatment of mortification is very simple. The best thing that we can do is to envelop the mortified part in a large poultice, and renew the latter as often during the day as cleanliness may require. The following poultices are those most frequently recommended by surgeons:

CHARCOAL POULTICE.

Add about two ounces of finely powdered charcoal to half a pound of common linseed poultice.

BEER POULTICE.

Take of the grounds of strong beer half a pint; add as much oatmeal as will make it pretty thick, and then stir it up.

YEAST POULTICE.

Add to an infusion of malt as much oatmeal as will render the substance of a proper thickness, and then add a spoonful of yeast. When the mortified portions are being detached, and the patient complains of much pain, we may add two or three teaspoonfuls of laudanum to the poultice.

To counteract the fetid discharge and smell which always attend cases of mortification, we may use with advantage the *chlorine lotion*, composed of one part of chloride of lime to eight parts of water.

MOUTH, INFLAMMATIONS OF.

Children are most liable to diseases of the mouth.

Simple inflammation of the mouth is recognized by the redness, swelling, and soreness of the gums and tongue.

It is treated by solutions of *marsh-mallow*, or *borax*, or *chlorate of potash*.

Thrush.—The symptoms of this disease are small whitish points and patches in the mouth. It is sometimes accompanied by fever. It is connected with a vegetative growth,—the *oïdeum albicans.*

One of the best remedies for this disease is *chlorate of potash*, in doses of from 5 to 30 grains, according to age of patient. It may be given in solution. (See *Chlorate of Potash.*)

When the child is feeble it should be supported by tonics.

Parents should avoid tampering with their children too much in this or in similar affections. It is best to be on the safe side, and use only simple measures until the physician arrives.

It is generally safe to use chlorate of potash in almost any form of inflammation of the mouth.

Canker of the mouth is a very disagreeable and sometimes protracted disease.

It consists of an *ulcer*, that forms on the gums, or lips, or cheek. It is of a whitish, grayish, or yellowish color. It is usually of a very offensive odor.

The ulcer may be washed with *glycerine* and water, weak solutions of *carbolic* acid and water (see *Lotions*), and may be touched with "blue-stone" or *sulphate of copper.* Everything should be done to sustain and strengthen the patient.

Gangrene of the mouth is a very serious disease. It begins with an ulcer on the cheek or gums. In time this spreads and assumes the character of mortification. The discharge is of a most offensive character. The disease may extend even to the bone.

This disease is caused by poor and insufficient food, and by *bad air.* It is an alarming affection, and needs the best possible skill.

The great thing is to strengthen and sustain the system of the child by stimulants, tonics, and nourishing food. Beef-tea should be used freely, and if necessary brandy or whiskey may be given.

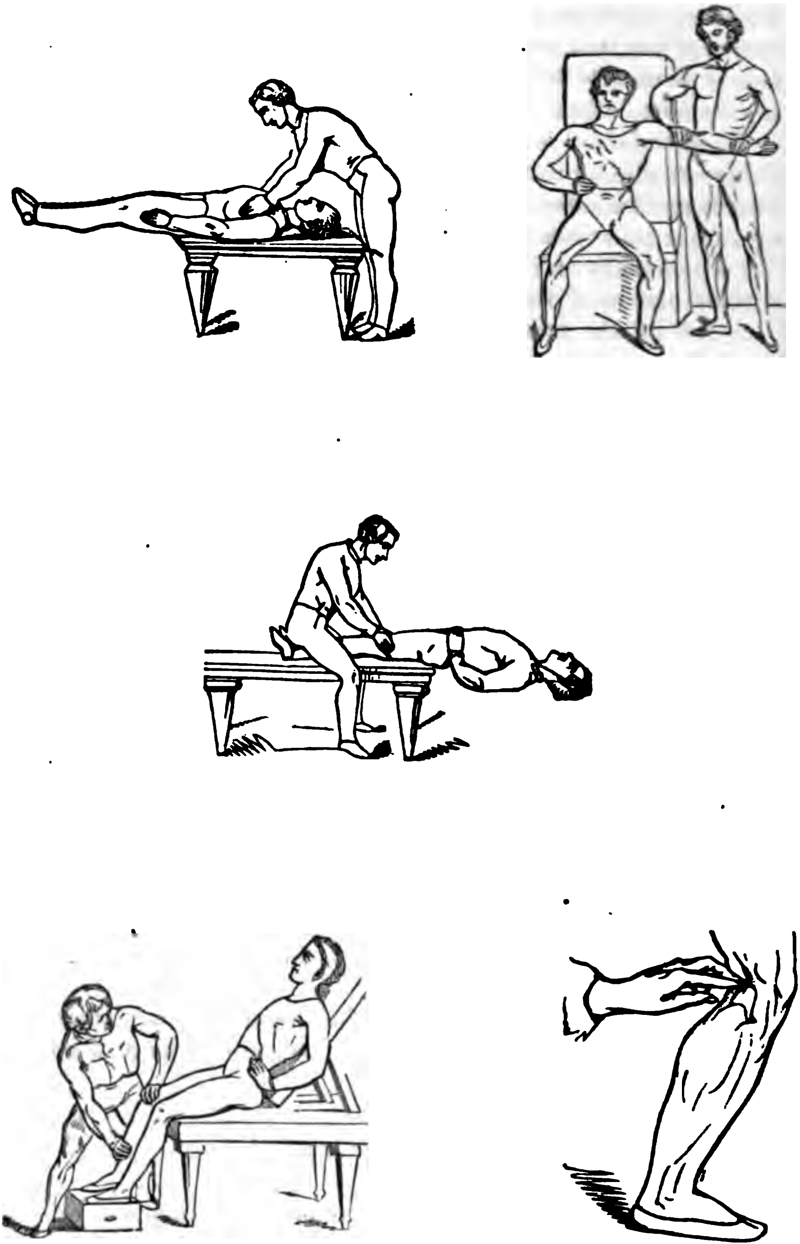
To the ulcer we may apply lotions of *carbolic acid*, or of *permanganate of potash*, or *sulphite of soda.* (See *Lotions.*)

Nursing sore mouth.—This is the familiar complaint of those who nurse children.

Like all other inflammations of the mouth, it is best treated by chlorate of potash. For adults it may be given in large doses, say 20 grains.

MOVEMENT CURE.

The Swedish Movements, that were originally proposed by Ling, have recently obtained a deserved popularity. Establishments for conducting this method of treatment are already in operation.



OPERATIONS OF THE MOVEMENT CURE.

Strictly speaking, all muscular exercise—walking, running, riding, jumping, skating, riding velocipedes—is a part of the movement cure. In our establishments, which are, or should be, conducted by experienced hands, the movements are carefully elaborated and systematized by the aid of machinery and various contrivances. In short, the "movements" are simply *exercise refined and systematized.* They exercise portions of the body, especially of the internal organs, that are little affected by ordinary activity. Hence their great benefit in many cases of chronic disease of these internal organs, especially of the abdomen.

General electrization and the "movements" both cause many muscular contractions, and in this way increase the processes of waste and repair in the system. Both are useful in dyspepsia, hypochondria, constipation, paralysis, and nervous exhaustion and other conditions of debility.

EXERCISES OF THE MOVEMENT CURE.

We present herewith some cuts representing a few of the exercises and manipulations of the movement cure. They are taken from Roth's treatise on the subject. These are but a few of many that might be described. Mechanical appliances of various kinds are employed. Some of these are put in motion by steam-power.

Gymnastics are very properly included under *Movement Cure.* The gymnasium is really an establishment for the preservation of health and the cure of disease by muscular movements. The chief difference between the two lies in this, that in the one case the movements are mostly passive, in the other mostly active. The movement cure is chiefly designed for those who are partial or complete invalids, the gymnasium for those who are comparatively well. The one is used to *regain* health, the other to *retain* it.

DUMB-BELLS.

This distinction is a very general one, and is by no means always or necessarily observed. Invalids who are quite weak may be much benefited by a judicious use of light gymnastics, and those who are in comparative health may also be profited by the passive exercises of the movement cure.

Gymnastics have been recommended by physicians from very early periods. The Greeks were famous for their athletic games.

Concerning the dress of the gymnast Mr. Watson remarks:

"The dress opens in front, and is both more convenient and more beautiful than one which opens behind. It is so constructed that the wearer's limbs are as free as air; that she can even clap her hands, with arms vertical, above her head without discomfort.

"It will be observed that the gentleman's dress is loose and comfortable. The primary object of the costume is not to exhibit rounded and shapely limbs and well-developed muscles, but to give ease and comfort to the student in all of his positions and movements. The military jacket, without unnecessary padding, is selected. It has no useless skirt, and the collar is neither high nor stiff. The trousers, which are very loose, are gathered in and buttoned at the ankle, or fastened with an elastic band or a small strap.

"Students may exercise in their street dresses. The gentlemen will remove their coats. The ladies will use elastic bands to sustain their skirts, so that the wearers' legs and feet may have free play. Bathing dresses will very generally be found pretty and appropriate for these exercises."

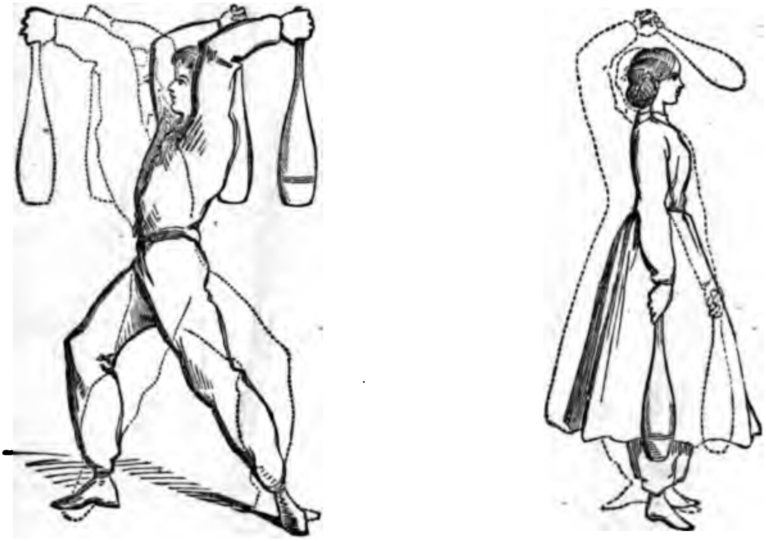
Concerning dumb-bells Mr. Watson gives these suggestions:

"Cast-iron dumb-bells of proper form and weight are deservedly popular among the best gymnasts. Heavy bells, however, are almost useless for exercise, affording only a few movements that serve as a test of strength. When using a single bell for this purpose, both arms should be employed to the same extent, so as to avoid a one-sided development.

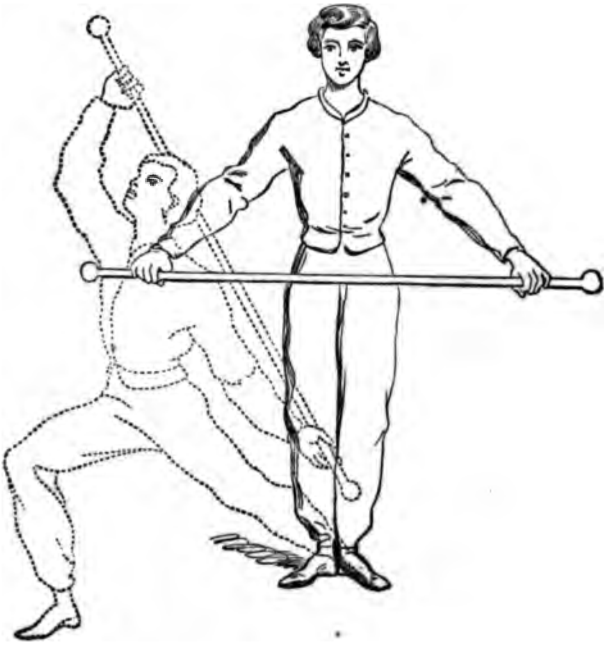
"Dumb-bells weighing from three to five pounds, properly used, are sufficiently heavy for the strongest man. Be one's time never so much limited, they should not weigh more than twenty-five pounds to the pair.

"The best and most approved dumb-bell at the present time is turned from wood. The timber should be sawed into scantlings, and well seasoned before turning it into bells. Maple, beech, birch,

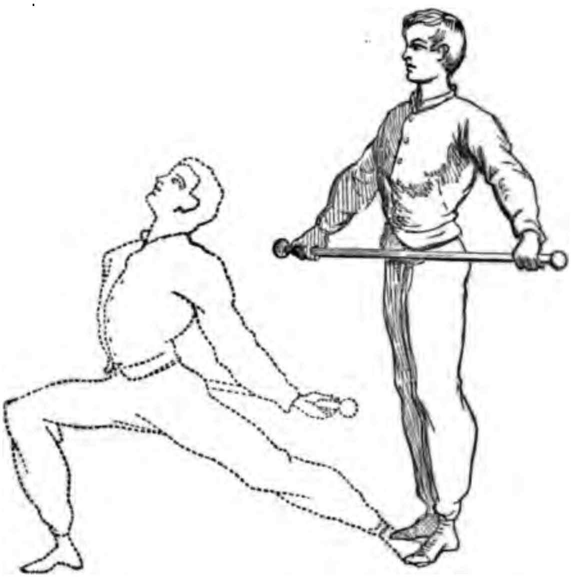
INDIAN CLUBS.



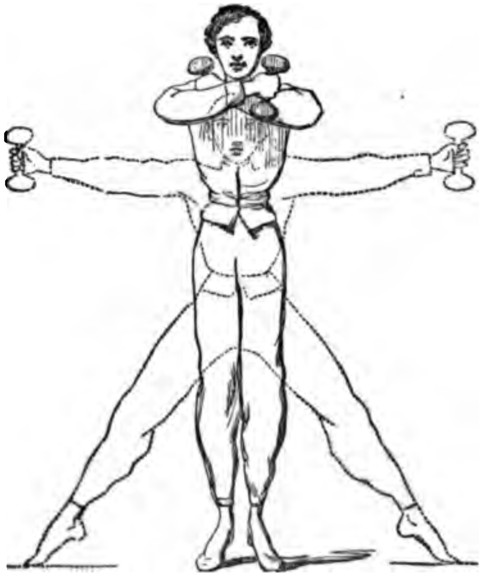
EXERCISES WITH INDIAN CLUBS.



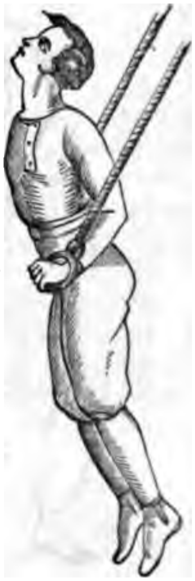
EXERCISES WITH WAND.



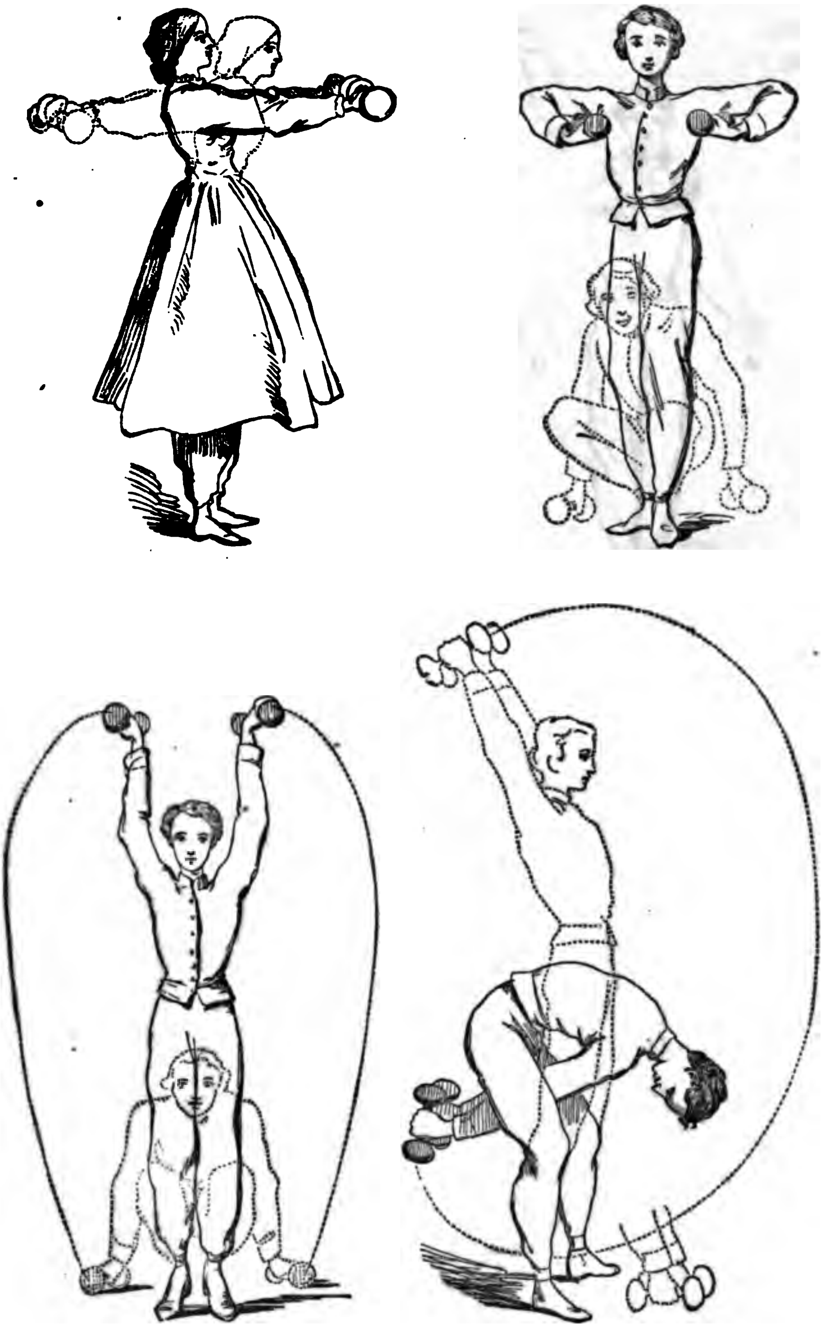
EXERCISES WITH WAND.



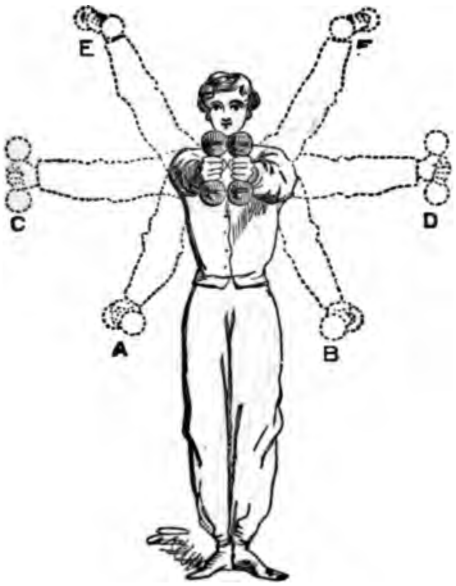
EXERCISES WITH DUMB-BELLS.



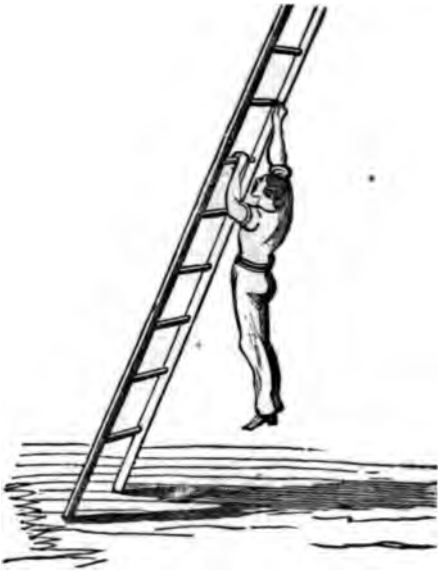
HAND-SWING, WITH RINGS.



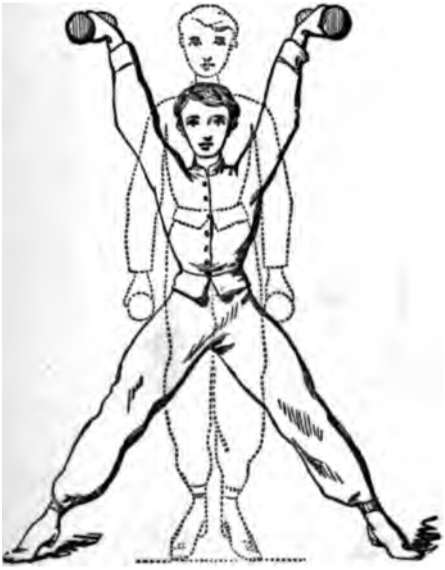
EXERCISES WITH DUMB BELLS.



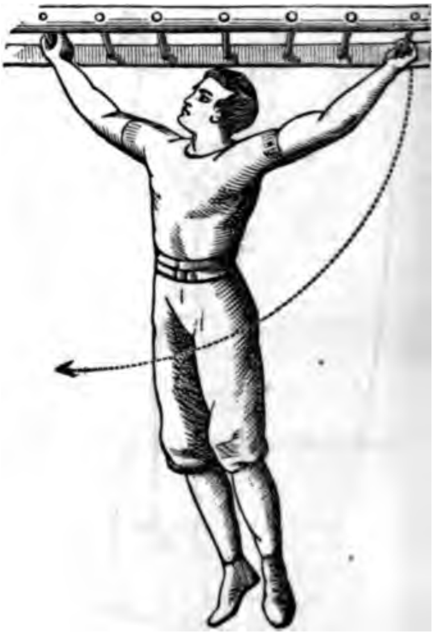
EXERCISES WITH DUMB-BELLS.



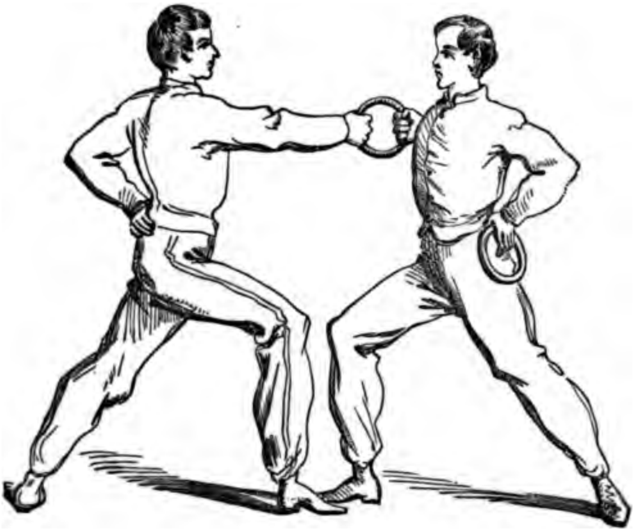
HAND-OVER-HAND ASCENT.



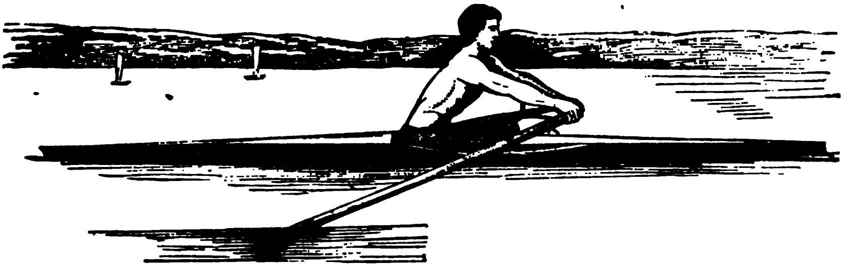
EXERCISES WITH DUMB-BELLS.



HORIZONTAL LADDER EXERCISE.



EXERCISES WITH RINGS.



ROWING IN A SINGLE WHERRY.

This, when not carried to excess, is one of the best of our methods of exercise. Boat-racing, for those who are to lead sedentary lives, is not to be commended. It is too violent and exhausting.

oak, and hickory make very good bells for family and school use Locust is the best domestic wood for this purpose; rosewood is still better; lignum-vitæ is best of all."

From J. Madison Watson's excellent treatise on this subject I have, by the courtesy of the author, selected a few cuts illustrating some of the exercises with the *wand*, *rings*, *dumb-bells*, and *Indian clubs.* The *dotted lines* denote the positions assumed by the operator during the exercises.

The "*Lifting Cure*" is a modification of the movement cure, and is to be so considered by those who inquire concerning it. The objection to the lifting cure is that it is too *exclusive.* The movement cure should exercise the whole body, and in a variety of ways. And yet there is no question but that some patients do receive benefit from the use of these special methods of movement.

There are those to whom any form of active or passive exercise —by whatever name it may be called—is always more or less beneficial.

It is a mistake to suppose that there is any mysterious virtue in any special method of exercises as such. Many who are benefited by a course of treatment by the lifting cure, or by the rubbing cure, or by *pounding*, or by any or all of the operations of the movement cure, would have been still more benefited by a trip into the country, a week of hunting or fishing, or by a few weeks' experience in boating. The great advantage of the movement cure is that it *systematizes* exercise, and by the novelty of its arrangements induces many to avail themselves of its benefits who otherwise would not use their muscles at all. As I have before remarked, one secret of the remarkable success of *general electrization* in nervous diseases is in the fact that it causes vigorous and repeated contractions of a large number of the principal muscles of the body.

RUBBING

Is a species of muscular exercise. It constitutes an important element of the movement cure.

ANIMAL MAGNETISM.

Of this science we as yet know little or nothing. The evidence that there is a certain mysterious force in the system, by means of which one person can influence another, is, to say the least, suggestive.

The *rubbing* exercises of the movement cure unquestionably benefit in some other way than by merely exciting muscular activity and stimulating the circulation.

It is not impossible that in the future the mystery of this force will be explained.

MUMPS.

This disease is seated in the parotid gland and surrounding cellular substance. It is sometimes epidemic, and is generally believed to be contagious. It usually commences with slight shivering, followed by hot skin, thirst, and other feverish symptoms, which seldom run high. The constitutional derangement is soon followed by swelling under the angles of the jaws, gradually extending over a considerable part of the throat affected. The swollen parts feel firm and elastic, are slightly red, and tender or painful. When the tumefaction is extensive, there is some difficulty in swallowing, and pain on moving the jaws. The disease generally begins to subside on the fourth or fifth day, and in the course of a few days the neck resumes its natural appearance; but in some cases, when the swelling is diminishing at the neck, the testicles in males and the breasts in females become swollen; this continues for some days, and then disappears gradually. Sometimes, however, the testicles remain enlarged for a considerable length of time. When the disease is confined to one side of the neck, the testicle or breast of the same side only is affected. This disease occurs most frequently in children, and generally in those of scrofulous constitution.

Treatment.—The mumps seldom require medical treatment. Stimulating food and drink should be avoided; mild laxatives are necessary, and a little purified nitre dissolved in barley-water may be taken. The neck should be protected from cold by covering it with fine flannel. If the testicles or breasts become swollen and painful it will be advisable to apply leeches, and afterwards warm fomentations of marsh mallow or poppy-heads, and warm poultices of linseed or bread and milk.

MURIATIC ACID.

It is sometimes employed both internally and as a gargle in typhus fever and scarlatina. From eight to fifteen drops, mixed with four ounces of water, are used by some practitioners as an injection for the cure of gonorrhœa. Muriatic acid is a good adjuvant to mercury in syphilitic cases, where there is constitutional irritability complicated with debility.

Nitro-muriatic Acid, which is so much used in diseases of the liver, is composed of three parts nitric acid to *five* parts of muriatic acid.

The dose is from three to eight drops in sweetened water.

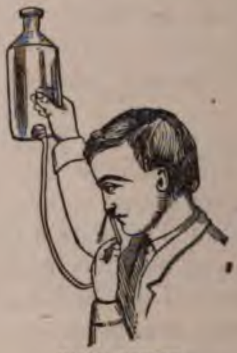
MUSK.

Musk is a peculiar secretion which is deposited in a small sac situated near the umbilicus of the *Moschus Moschiferus*, or musk animal, a native of the Himalaya Mountains and other elevated regions of Asia.

The dose is from six to twenty grains, repeated, if necessary, every five or six hours. It is difficult to obtain that which is genuine.

NASAL DOUCHE.

This is a very simple arrangement for cleansing the nasal passages in catarrh (*rhinitis*). (See *Catarrh.*) It consists of a bottle, with a piece of rubber tubing attached to an outlet at the bottom. To use the douche, fill the bottle partly or entirely with the weak solution of common salt or chlorate of potash, or whatever is desired; place one end of the rubber tube in one of the nostrils; now slowly raise the bottle high enough so that the liquid will flow into one *nostril and out of the other*, thus cleansing both passages. (See cut.)



NASAL DOUCHE.

This is an excellent domestic remedy for catarrh of the nasal passages. (See *Catarrh.*)

NERVOUS DISEASES OF MODERN TIMES.

The types of disease, like the types of character, change with the progress of civilization. If we look closely enough into this subject, we see that it could not be otherwise. All disease is an abnormal condition of the body, and is, of course, variously modified by the nature and condition of the body. As the body changes, so must its diseases change. Take, for illustration, the very familiar disease which we call measles: we find that it behaves very differently with different constitutions and in different states of the system. Although there are certain characteristics by which it is to be recognized in all, yet it behaves very differently in the strong and the weak, in the phlegmatic and the nervous.

What is true of measles is more or less true of all other diseases.

Small-pox, rheumatism, the different forms of fever, diseases of the skin, affections of special organs—all are variously modified by the age, the sex, and the nature of the constitution. This fact is so well recognized in science that it may be regarded as a truism.

But the modification of disease by the constitution does not stop here. *New* diseases, or *new* phases of disease, are developed corresponding to *changes* in the constitution. The diseases of youth are different from those of infancy, of adult life from those of youth, while those of old age are different from those of adult life.

The same law applies to nations as well as to individuals. In the infancy of mankind the diseases of mankind were both fewer and simpler than at present. With the advance of civilization, with the increase in the forms of activity, with the modifications that the constitution has undergone, by the pressures, the excitement, and the manifold anxieties of modern society, there has been a corresponding change in the types of disease. Instead of a few diseases, we now have many. The few diseases of old times were, however, more fatal than the many of recent dates. Instead of a few plain symptoms, we now have legions of symptoms—subtle, undefined, overlapping and running into each other.

In the infancy of mankind, indeed in all ages and countries prior to the last two centuries, the muscles were used more than the brain. Consequently, the predominant diseases were those which chiefly affected the muscular and vascular systems, such as fevers, inflammations, etc. In this ripening maturity of mankind, and among all *enlightened people, especially since the invention of printing, the brain has been used more than the muscles.* Consequently, the predominant diseases of our day are those which *chiefly affect the brain and nervous system.*

Within the past twenty-five or thirty years there has been observed a marked increase in the number and in the severity of what are known as *nervous diseases.* This fact has been observed, not only by the profession but by the people, and is now generally accepted.

I am aware that on these subjects there is great liability to error. We are apt to judge from indefinite general impression, without regard to statistical facts. Now general impressions, in regard to changes in the types of disease, are very apt to be erroneous. And yet on this subject the general belief is, I think, correct. Statistics, so far as they go, seem to confirm this general impression.

There is no question in my mind that nervous diseases have been on the increase for the past quarter of a century, and that they are still increasing with the advance of our civilization.

The question now arises, what are *nervous diseases?* I reply, diseases that primarily or chiefly affect the brain, the spinal cord or the nerves that issue from them, or the sympathetic system.

Paralysis is a nervous disease. It is always a result of some diseased condition of the brain, of the spinal cord, or of some of the nerves that issue from them. It may take place by reflex action from diseases of the bowels, the womb, etc.; but in such cases it takes place through the nerves. (See *Paralysis.*)

Neuralgia is a nervous disease. It may result from the same causes that produce paralysis. The derivation of the word itself means "pain of the nerve." It is a very distressing and very common affection, but very fortunately it is much more susceptible of relief than formerly. (See *Neuralgia*, *Tic Douloureux.*)

Dyspepsia and *Constipation are usually nervous diseases.* They are usually results of general nervous debility. They are symptoms of exhaustion. Dyspepsia may result from inflammation of the stomach, from cancer, from ulcer, or other local difficulty; but in the majority of cases in our times it is a symptom of constitutional nervous disturbance, and should be treated accordingly. (See *Dyspepsia* and *Constipation.*)

Nervous exhaustion is a nervous disease. The blood may be healthy in quantity and quality, the muscles may be large and firm and wiry, and withal the system may be thoroughly debilitated: no organic disease can be detected; and yet the patient is depressed, sleepless, feeble, incapable of severe exertion of mind or body. There are thousands of women in our land who spend nearly their whole lives in a condition of *nervous exhaustion.* They are never actually confined to the bed for any length of time. Perhaps they rarely consult a physician, and yet they never know what it is to be really well. To vigorous, lively health they are strangers. There are students who, during their educational career, pass through this stage between the ages of fifteen and twenty. There are young ladies who pass through this same stage perhaps for many years before they arrive at strength and womanhood. There are in our time both men and women who never know any other condition or feeling than that of nervous exhaustion. (See *Nervous Exhaustion.*)

Hypochondria is a nervous disease. It is probably in all cases a symptom of some disturbance of the brain or of the sympathetic system. It is oftentimes, though not always, a premonitor of insanity. This statement need not frighten those who are troubled with hypochondria, except so far as to make them vigilant to use all proper means to accomplish a cure. It was formerly supposed that hypochondria was not a disease, but merely a whim. Physicians are now beginning to see that it is really a disease, and that it must be treated as such; and that it is curable, frequently as relievable, as other diseases. It may afflict those who have exceedingly strong muscles, who have excellent good sense, and who naturally are jovial and light-hearted. In hypochondria the whole character frequently becomes changed. This change probably corresponds to some changes in the nervous system. The hypochondriac is not entirely a free moral agent. (See *Hypochondria.*)

St. Vitus's dance is a nervous disease. It occurs chiefly in children, though it may be met with in adults, and even in the aged. It occurs in those whose nervous systems are in some way debilitated. It is caused probably by some subtle derangement of the spinal cord or brain, or of both. Sometimes it is confined to a single nerve, or branch of a nerve. (See *St. Vitus's Dance.*)

Epilepsy is a nervous disease. This also is a symptom of various diseased conditions, and oftentimes of the most opposite character. It may occur in those who are apparently strong. (See *Epilepsy.*)

Spermatorrhœa is usually a *nervous disease.* It was formerly supposed to be a *local* difficulty merely, a result of local inflammation. The truth is that it is like dyspepsia,—usually a symptom of constitutional debility. It is more frequently a *result* than a cause. The masses of the people have very erroneous ideas on this subject. The tendency is to exaggerate its importance, and to attribute to it many diseases that it does not bring on, but of which it is itself the *result.* Nearly all the popular ideas on the subject of seminal emissions are wrong. (See *Spermatorrhœa.*)

Hysteria is a nervous disease. It is a symptom of some subtle, indefinable difficulty of the brain, the spine, or of the sympathetic system. Like many other nervous diseases, it may occur in those who are apparently muscular and strong. Hysteria sometimes runs into actual insanity. It is a positive disease, like hypochondria; and like hypochondria it should be treated with patience and with judgment. Like hypochondria it is very susceptible of treatment, is oftentimes relievable and curable. (See *Hysteria.*)

Sick headache is a nervous disease. Like epilepsy it is a kind of disturbance of the nervous force, somewhat analogous to the magnetic disturbances of the heavens. Like the other nervous diseases, it may occur in those who have large, firm muscles. It is popularly supposed to be the result of "*biliousness.*" Biliousness is a term that really means nothing, and is very apt to mislead. When one feels sick at the stomach we say that he is bilious. Now sickness at the stomach may result from lack of bile as well as from overflow of it. It may result from a merely diseased condition or morbid irritability of the nerves that supply the stomach. The nausea and vomiting of sick headache are frequently, like the pain in the head, the results of the nervous disturbances, and not the causes. (See *Sick Headache.*)

Sea-sickness is a nervous disease. (See *Sea-sickness.*)

Insanity is a nervous disease, and like all other nervous diseases, it has probably increased with the advance of civilization. It is always a symptom of some morbid condition of the most important part of the central nervous system. (See *Insanity.*)

Besides these, *loss of voice*, *asthma*, may be nervous in their character. (See *Larynx*, *Diseases of*, and *Asthma.*)

Tetanus, or locked-jaw, is a nervous disease. It was formerly supposed to be of an inflammatory character. It is now regarded as essentially a nervous affection.

Hydrophobia is a nervous disease, and is treated accordingly, though unfortunately without success. (See *Hydrophobia.*)

Delirium tremens and *chronic alcoholism* and *dipsomania*, and other similar or allied affections that arise from the abuse of stimulants and narcotics, are pre-eminently nervous diseases. (See *Delirium Tremens*, *Dipsomania*, and *Stimulants and Narcotics.*)

Convulsions of all kinds, and from whatever cause proceeding, are to be classed among nervous diseases. (See *Convulsions.*)

Sleeplessness (*insomnia*) is usually a nervous disease. It is a symptom of some disordered condition of the brain or of some portion of the nervous system. It is a symptom which in these days is exceedingly common. Prolonged and obstinate sleeplessness is one of the symptoms of impending insanity. (See *Sleeplessness.*)

Catalepsy is a nervous disease. This is not, however, a very common affection, and is only mentioned here for the sake of completeness. (See *Catalepsy.*)

Green-sickness is now regarded as a nervous disease; formerly it was confounded with anæmia (poverty of blood). Recent investigations have shown that in green-sickness the blood may be in a healthy condition.

GENERAL TREATMENT OF NERVOUS DISEASES.

Nervous diseases are usually to be treated by concentrating on the system *all possible tonic influences.* While every case must be studied by itself and treated by itself, yet this general principle will apply to nearly all the nervous diseases of our time. In connection with tonic influences it may be necessary to use remedies that have a calming influence on the system, such as bromide of potassium, oxalate of cerium, and the like.

It is not well to depend exclusively on any one tonic remedy, but to concentrate the influence of a number simultaneously on the system.

The chief tonic influences that may be employed in the treatment of nervous diseases are:

1. *Air, and sunlight, and exercise.*

There are many, however, who cannot take active exercise. Such persons may often be benefited by the passive exercises of the *Movement Cure.* (See *Movement Cure;* see also *Air, Sunlight,* and *Exercise* under *Hygiene.*)

2. *Nourishing food.*

Nervous patients were formerly half-starved. We now know that they need the best of nourishment. (See *Food* under *Hygiene.*)

3. *General electrization.*

This remedy, though not a specific for any one disease, yet is remarkably efficacious in the treatment of nervous disorders. (See *General Electrization.*)

4. *Movement Cure.*—That active and passive exercise of the muscles operate beneficially on the nervous system, no one will now question. (See *Movement Cure, Gymnastics.*)

5. *Internal tonics.*—The best internal tonics for nervous diseases are phosphorus, phosphoric acid, pyrophosphate of iron, strychnine, arsenic, quinine. (See remarks on these remedies.)

6. *Water.*—Bathing is oftentimes very useful for nervous patients. Some are greatly benefited by the *Russian* or *Turkish baths.* The *shower-bath* is a very powerful tonic for those few who can bear it and know how to use it. *Salt-water bathing* is for many an agreeable and very efficient tonic. (See *Water Cure.*)

Several of these remedies and systems of treatment may be tried simultaneously or consecutively.

When all these measures fail, the patient, if able, and unless the judgment of his medical adviser forbid, may visit the various springs and baths.

The results of the treatment of nervous diseases depend very much on the *perseverance and force of will* of the patient.

Nervous patients should not expect too much. In very many cases they should be content if they are relieved or approximately cured.

Besides all these general principles of tonic treatment, nervous patients will frequently need special treatment of a very different kind.

Most of these special methods of treatment are described under the different nervous diseases.

NETTLE-RASH.

No part of the body is exempt from nettle-rash. It appears in large, flat, elevated patches or wheels, of irregular shape, hard, of a pale red color, but in some instances whiter than the surrounding skin, and is attended with severe itching and tingling. The eruption is sometimes accompanied by a slight degree of fever; in other cases it appears suddenly, without any constitutional disturbance. It generally appears in the morning, vanishes in the course of a few hours, and perhaps reappears twice or thrice in the course of the day. After breaking out repeatedly in this manner, it usually disappears entirely at the expiration of six or eight days, sometimes much sooner. Nettle-rash occurs most frequently in young people and females; it is generally if not always connected with disorder of the digestive organs, and in particular constitutions is readily produced by certain articles of food, as lobsters, crabs, mussels, and other kinds of shell-fish; cucumbers, mushrooms, &c.

Treatment.—In mild cases little will be required beyond light farinaceous diet and gentle laxatives. When the eruption appears after taking into the stomach certain substances which disagree with it, or to which it is unaccustomed, an emetic of *ipecac* generally effects a cure. Nettle-rash generally yields in the course of two or three days under the use of low diet, mild laxative medicine, and drinking freely of lemonade, or barley-water containing a little nitre.

NEURALGIA.

Under the general term neuralgia, which, fifty years ago, was but little known either to the profession or the laity, is now included one of the most frequent and distressing symptoms of the chronic diseases of our time.

Strictly speaking, all pain, in any disease, is nerve pain; and therefore the term neuralgia might be applied to every phase of disease, acute and chronic, that is attended with unpleasant sensations. This term, however, as ordinarily employed, designates an affection of the nervous system, which is attended with pain in the course of some of the principal sensory nerves.

When, in any disease, the pain follows the course of any particular or prominent nerve-branch, it receives the name neuralgia. The pains of the affection are usually quite sudden in their onset, and are of a lacerating, stabbing, darting, or burning character. They are more or less intermittent, and are not ordinarily accompanied by any constitutional febrile disturbance.

The following division of the neuralgias is taken from Reynolds' "System of Medicine:"

"(*a*) *Neuralgia of the fifth* (*trifacial or trigeminal*).
"(*b*) *Cervico-occipital neuralgia.*
"(*c*) *Cervico-brachial neuralgia.*
"(*d*) *Intercostal neuralgia.*
"(*e*) *Lumbo-abdominal neuralgia.*
"(*f*) *Crural neuralgia.*
"(*g*) *Sciatic neuralgia.*"

Complicated cases occur that arise from a variety of causes. A patient afflicted with anæmia or neurasthenia may suffer from neuralgia that may be aggravated by neuritis, or by a wound or bruise. A curable case of neuralgia of malarial origin may be rendered incurable by the supervention of organic disease of the brain or spinal cord. Illustrations of these varied forms are sufficiently familiar to the practitioner. The prognosis of the affection manifestly depends on its causation. It is impossible to give an intelligent opinion in any given case, without first ascertaining the predominant condition on which the symptoms depend. The principles on which neuralgia is to be treated are simply these two: *first, to relieve the pain;* and, *secondly, to remove the cause.*

Constitutional neuralgias are those which depend on morbid constitutional conditions. Under this head are, therefore, included those which are caused by anæmia, by neurasthenia, and by the poisons of malaria, minerals, and the various toxic diseases.

The constitutional conditions that are most frequently the causes of this form of neuralgia are unquestionably anæmia and neurasthenia, or what is commonly known as nervous exhaustion, inasmuch as these conditions are themselves very frequently the results of poisoning of the system by mercury, lead, opium, alcohol, malaria, rheumatism, gout, etc.

Neuralgia unquestionably causes a vast amount of suffering In this country it afflicts nearly every family. Some are martyrs to the disease all their lives, and find from medicine only temporary relief. It is therefore important for every one to know what methods of treatment are used by physicians, as well as those measures that are of a domestic character.

TREATMENT OF NEURALGIA.

1. To relieve the pain temporarily.

The best method of relieving neuralgic pains is by hypodermic injections of morphine and atrophine. (See *Hypodermic Injections.*) This method of treatment is not, however, well understood by the people, and is not used by all in the profession. Accidents occasionally occur from its use.

Electrization frequently acts like magic in neuralgia. General electrization is usually to be preferred. Sometimes galvanization is most successful, and in other cases faradaization. (See *Galvanization*, *Faradaization*, and *Electrization*.)

Veratria ointment (fifteen grains of veratria to one ounce of lard) rubbed over the painful nerve is sometimes efficacious.

In some cases it is well to make a small blister, and then to place on the raw surface a grain of morphine diluted with a little gum arabic. Of all these measures my preference is for *electrization*, in those cases where it will succeed. It not only affords temporary relief, but when repeated perseveringly is one of the best curative remedies that we have. There are many, however, who are so situated that they cannot avail themselves of the assistance of a physician who employs electrization. For such it is, of course, necessary to depend on other remedies. In desperate cases physicians sometimes give inhalations of æther or chloroform.

2. To break up the attacks. Usually the patients need tonic treatment. (See *Nervous Diseases*, *Treatment of*.)

There are some cases of neuralgia that are in their nature incurable. They may depend on some incurable disease.

NEURASTHENIA, OR NERVOUS EXHAUSTION.

The character of this malady, if I be allowed to call it such, may best be understood by comparing and contrasting it with *anæ-*

mia, a condition which has been more thoroughly discussed, and is therefore more vividly appreciated, by the profession at large.

Anæmia is to the vascular system what *neurasthenia* is to the nervous. The one means want of *blood;* the other, want of *nervous force.*

Both anæmia and neurasthenia may be the *effects* of acute or chronic diseases, and both may be either acute or chronic in their course. Thus neurasthenia may be the effect of wasting fevers, exhausting wounds, parturition, protracted confinement, dyspepsia, phthisis, and so forth. Anæmia, as is well known, may result from the same diseases.

Both anæmia and neurasthenia may also be the *cause* of chronic and acute diseases. Thus neurasthenia, or nervous exhaustion, may give rise to dyspepsia, headaches, paralysis, insomnia, neuralgia, rheumatic gout, spermatorrhœa in the male and menstrual irregularities in the female. Anæmia also is the source of many of these diseases, though perhaps it is more frequently the effect.

Anæmia and neurasthenia may cause each other; anæmia is often the result of neurasthenia, and *vice versa.*

Both anæmia and neurasthenia are most frequently met with in civilized, intellectual communities. They are a part of the compensation for our progress and refinement.

Anæmia and neurasthenia may run into each other, and become so closely interblended that it is oftentimes impossible to determine which was the cause and which was the effect, or which is the ruling condition.

Both of these conditions, whether existing separately or in combination, are best treated by some form of constitutional tonics. In anæmia we give those tonics that directly and specially affect the *blood;* in neurasthenia we give those remedies that directly and specially affect the *nervous system.*

Neurasthenia may result from any causes that exhaust the nervous system. Hereditary descent terribly predisposes to neurasthenia, just as it predisposes to all forms of nervous derangement. The law of *reversion* is frequently illustrated here; and sick headache, epilepsy or insanity or dyspepsia in the grandfather may skip over a generation, and show itself as neurasthenia in the grandchildren. Among the special exciting causes of neurasthenia may be mentioned the pressure of bereavement, business and family cares, parturition and abortion, sexual excesses, the abuse of stimulants and narcotics, and civilized starvation, such as is sometimes observed even among the wealthy order of society, and sudden retirement from business.

The *diagnosis* of the neurasthenic condition is sometimes entirely clear, and again is quite difficult. The diagnosis is obtained partly by the positive symptoms, and partly by exclusion. If a patient complains of *general malaise, debility of all the functions, poor appetite, abiding weakness in the back and spine, fugitive neuralgic pains, hysteria, insomnia, hypochondriasis, disinclination for consecutive mental labor, severe and weakening attacks of sick headache, and other analogous symptoms*, and at the same time gives *no evidence of anæmia or of any organic disease*, we have reason to suspect that the central nervous system is mainly at fault, and that we are dealing with a typical case of neurasthenia. But neurasthenia may be associated with anæmia and with almost every conceivable form of organic disease. In such cases it is sometimes very difficult to ascertain whether it is the cause or the effect. The history of the symptoms will help us to decide this question; which is, however, of little import, for in either case the general treatment will be substantially the same.

Chronic neurasthenia—of which form I am chiefly speaking—may result in paraplegia, in general paralysis, in neuralgia, in uterine disturbances, in dyspepsia, in chorea, in hypochondriasis, in hysteria, and in actual insanity; or under proper treatment it may go on to perfect recovery.

Chronic neurasthenia sometimes proves directly fatal, without causing any organic disease; but such a termination is not usual. It is a chronic condition, and patients afflicted with it may last for half a century. We are all of us more or less familiar with such cases. I have a friend who has been afflicted with neurasthenia for more than fifty years, and yet during all this time he has been severely engaged in the complicated duties of a lawyer, a judge, and a man of business. There is not an organ of his body that has not suffered from this prolonged neurasthenia; from the time he was fifteen years old until now there has been no day in which he has been free from pain. Even anæmia has supervened, but though the lamp of life has often flickered, yet at the advanced age of seventy it still "holds out to burn."

The one principle on which neurasthenia is to be treated is by the concentration of all possible tonic influence on the nervous system—air, sunlight, water, food, rest, diversion, muscular exercise, and the internal administration of those remedies—such as strychnine, phosphorus, arsenic, &c.—which directly affect the central nervous system (See *Nervous Diseases, Treatment of.*)

NIPPLES, SORE.

Women when nursing are liable to have sore nipples,—a complaint which is very troublesome, and in many cases not easily subdued. This may sometimes be prevented by washing the nipples frequently during a month or two before delivery, with equal parts of the *tincture of myrrh*, and a strong *decoction of oak bark*. When, however, the nipples have become excoriated and chapped, an artificial teat attached to a shield should be employed, and some mild astringent lotion used several times daily.

When the nipple and parts surrounding it become inflamed and sore, it will be necessary to apply warm poultices of bread and milk, or flax-seed meal, to reduce the inflammation, after which a little sweet cream should be used to heal the excoriation.

NITRATE OF SILVER CRYSTALS.

Of late years solutions of nitrate of silver have been much used for chronic inflammations of mucous membranes.

It is used for chronic inflammations of the larnyx, and with good results. It is also used for chronic inflammation of the uterus and urethra. It is sometimes given internally in small doses, as a tonic in epilepsy and other nervous diseases.

It is applied to the larynx by means of sponges or brushes. (See *Laryngitis* and *Laryngoscope.*)

The solutions used vary in strength from 2 grains to 60 or 120 grains to the ounce.

The common prejudice that nitrate of silver is necessarily injurious is not well founded. It is one of the best of our remedies for chronic inflammations of mucous membranes.

NITRE.

Nitre (nitrate of potash, saltpetre) is an excellent medicine to abate heat, and is used for this purpose in all inflammatory diseases and hemorrhages. Given in small and frequently repeated doses, to the extent of a drachm or eighty grains in the course of twenty-four hours, in cold water, toast water, or barley-water (each dose being dissolved at the time it is to be administered), it diminishes the strength and frequency of the pulse, while it lowers the animal heat, and abates thirst; and is consequently regarded of great value.

Nitre is sometimes given as a diuretic in dropsical cases; and in the proportion of a drachm and a half to half a pound of water, is frequently prescribed as a gargle in different kinds of sore throat.

Five ounces of nitre, with five ounces of sal ammoniac (muriate of ammonia) dissolved in sixteen ounces of water, will reduce the temperature of the liquid forty degrees. Hence this mixture placed in a bladder is used as an external application in various cases: to the head in inflammation of the brain and apoplexy, to the lower part of the belly in some cases of retention of urine, to the belly in violent floodings, and to hernial tumors (when ice cannot be obtained) to diminish their size and facilitate their reduction.

NITRIC ACID.

Nitric acid is often of great service in syphilis when the use of mercury would be improper. It is more particularly useful when the disease is complicated with scrofula or scurvy, when it is accompanied with much debility, and in patients whose constitutions have suffered from the excessive use of mercury. In such cases it is generally given along with the compound decoction of sarsaparilla; sometimes it produces salivation. The diluted nitric acid of the pharmacopœia is the form in which it is generally used. This is prepared by mixing one fluid ounce of nitric acid with nine fluid ounces of distilled water, and the dose is from twenty to thirty drops, in water sweetened with syrup or sugar, three times a day. This acid injures the teeth; it is therefore advisable to drink the mixture through a glass tube, and afterwards wash the mouth.

Nitric acid is given in the same manner as the sulphuric and muriatic acids, in cases of gravel, where the urine deposits a white sediment.

As an application to certain ill-conditioned or sloughing ulcers, Sir Astley Cooper recommends a lotion composed of fifty drops of nitric acid to a pint of water. Some practitioners use two drachms of the diluted acid mixed with an ounce of water, as a stimulating application to fetid sores attended with a thin acrid discharge.

NITRO-MURIATIC ACID. (See *Muriatic Acid.*)

NUX VOMICA (STRYCHNINE).

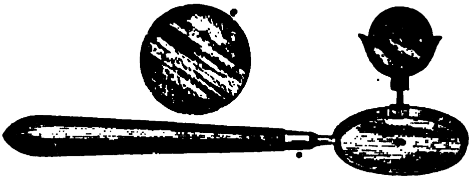
This is the product of a tree that grows in Ceylon.

It is much used as a tonic. It directly affects the spinal cord, and is therefore frequently successful in paralysis that is dependent on diseases of the cord. Nux vomica is one of the best of our many uncertain drugs for dyspepsia and nervous exhaustion. It is very useful in constipation, and is an ingredient in some of our laxative pills. The dose is *from three to five grains.* The tincture is usually given in doses of from ten to twenty drops.

At the present time *strychnine*—which is prepared from nux vomica—is more used than the nux vomica itself. (See *Strychnine.*)

OPHTHALMOSCOPE AND OTOSCOPE.

Physicians examine the eye with the ophthalmoscope. With the otoscope they examine the ear. The ophthalmoscope is represented in the accompanying cut.



LIEBREICH'S OPHTHALMOSCOPE.

The use of the ophthalmoscope has wrought a great change in the study of diseases of the eye, just as has the *laryngoscope* in diseases of the larynx, and the *stethoscope* in diseases of the chest, and the *microscope* in diseases of the urinary organs.

By the aid of the ophthalmoscope the physician can see the retina and the nerve of the eye, and can determine whether they are in a condition of health or disease. Since the discovery of the ophthalmoscope the science of diseases of the eye has made wonderful progress.

The otoscope consists simply of a mirror to reflect the light, and a speculum for the auditory canal. (See *Speculum.*)

OPIUM.

Opium is the concreted juice of the capsule or head of the white poppy.

Opium renders the pulse fuller, stronger, and quicker. The latter action, however, is not always produced. For example, when the pulse is quick and frequent in consequence of debility, opium makes it slower and more regular, and strong doses render it even slow and similar to that which is met with in apoplexy. A moderate dose taken when in a state of health always slightly accelerates the pulse.

Opium, besides the property which it possesses of increasing the action of the heart and the fulness and frequency of the pulse, exerts a powerful influence as a *narcotic*—that is, in diminishing the sensibility of the nervous system, allaying pain, and procuring sleep. But when the pulse is hard, the skin hot and dry, and other feverish symptoms are present, or when we have reason to believe that inflammation is commencing, it would be improper to administer opium as a narcotic, because its primary or stimulating action would certainly aggravate the symptoms.

Opium is much used *externally* to mitigate pain and allay spasmodic action. When employed in this manner, it is applied in the form of laudanum, or mixed with camphorated oil; and is found very serviceable in colic, hysteria, and other similar diseases.

Two or three grains of opium, introduced into the rectum, are very efficacious in relieving tenesmus,* spasmodic stricture, and in alleviating the pain arising from cancer of the womb.

The wine of opium dropped into the eye is an excellent application in chronic ophthalmia, and is in very general use.

In 1804, a German chemist, named Serturner, discovered an alkaline substance which has been called *morphia;* this combines with several acids, and forms salts. The acetate, muriate, and sulphate of morphia are at present in general use, and have the advantage of being less injurious to the digestive organs than solid opium. These salts are given instead of opium in the dose of from a quarter to three quarters of a grain; the subjoined formula is of the same strength as laudanum:

Acetate of morphia, sixty-four grains,
Distilled water, fifteen ounces,
Proof spirit of wine, one ounce. Mix.

The usual dose of opium is one grain, of laudanum twenty drops, and of the salts of morphia a quarter of a grain.

OXALATE OF CERIUM.

This medicine, which comes in the form of a whitish powder, was recommended by Dr. Simpson, of Edinburgh, for *nausea of pregnancy.* I have found it very efficacious in *sickness of the stomach, sick headache*, and in irritable conditions of the stomach generally. It was first recommended to me by my friend Dr. Heath. I feel quite confident that if the remedy were better known it would be more used. Sometimes it acts like magic, relieving headache and nausea almost as quickly as a hypodermic injection.

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* "An urgent, distressing, and almost painful sensation, as if a discharge from the intestines must take place immediately; always referred to the lower part of the rectum."

The dose is *from one to three grains*, repeated as frequently as may be needed. The powder may be taken dry on the tongue.

OXYGEN.

Inhalation of oxygen is now beginning to be used as a *stimulating tonic* in a variety of diseases. It is used with more or less success in *asthma*, *bronchitis*, debility, and various affections of the heart and lungs. I believe that it will certainly prove an excellent aid to general electrization and movements, in the treatment of dyspepsia and other nervous disorders of our times. I believe that it is destined to be used much more than it has been in the past. Scientific men are now investigating its properties with most commendable zeal.

Oxygen is prepared by those who have the requisite appliances, and is administered in doses of one, two, three, four or more gallons, according to the patient.

It is usually, and I believe most successfully, given in combination with common air.

PARALYSIS.

Paralysis may be loss of *motion* or of *sensation*, or of both. It is a symptom of many different diseases. It results from *apoplexy*, and is then called *hemiplegia*,—from *softening of the brain*, and indeed from a large variety of injuries of the brain. It results from disease of the spine, congestion, inflammation, and degeneration; and then it attacks the lower limbs. Paralysis of the lower limbs is called *paraplegia*.

Of late years much attention has been given to a disease called *locomotor ataxy*, in which the patient, though not actually paralyzed, yet cannot control the movements of his limbs. It is a very grave disease.

Paralysis may extend to almost any nerve or branch of a nerve. It attacks the face and draws it one side. It attacks the tongue and throat, and renders speaking difficult or impossible. It attacks the bowels, the bladder, and the heart. It attacks the whole trunk and limbs at once, and then it is called *general paralysis*. This is observed in insane persons. It attacks all ages, but especially the two extremities of life—*the very old and the very young*. Paralysis of infants—which is quite frequent—is called *infantile paralysis*.

Paralysis sometimes results from exhausting fevers. It may follow diphtheria.

Paralysis results from lead poisoning, from rheumatism; *indeed it may come from almost any cause that injures the system.*

Over-worry, anxiety, excitement, undue ambition, the indulgence of passions—these are the great causes of paralysis. Labor of the brain is healthful; within reasonable limits it is conducive to health and longevity. (See *Influence of Occupations on Health and Longevity.*) But labor of the brain that is accompanied by excessive anxiety, and that is pursued irregularly, spasmodically, and under unequal pressures, exhausts the nervous system, and may bring on paralysis, or almost any other manifestation of nervous disease.

Apoplexy, which gives rise to paralysis of half the body (*hemiplegia*), appears to be on the increase among us. It was formerly the impression that those who had large heads, heavy and full cheeks, were most liable to apoplexy; but in these times we find that not unfrequently the thin, nervous, delicate, and even the young, are taken down by this disease.

Even children are sometimes paralyzed in one-half of the body.

PARALYSIS OF THE LOWER LIMBS.

This form of paralysis, which is called paraplegia, is also very frequent. It occurs at all periods of life. It may result from some disease of the spinal cord. (See *Spinal Cord, Diseases of.*) It may result from diseases of the urinary organs.

There is a difficulty of controlling movements, which closely resembles paralysis, and yet is a really different affection. (See *Locomotor Ataxy.*)

Paralysis may attack the *eye*, the *ear*, the *larynx*, the *tongue*, the nerves that supply the lungs, stomach, heart, and bladder, and indeed any part or organ of the body.

To specify and describe in detail all the varieties of paralysis that may occur would occupy much space. To mention even the names that are given to them by physicians would be useless.

INFANTILE PARALYSIS.

When paralysis of the arms or legs occurs in children it is called *infantile paralysis.* This disease is of quite frequent occurrence. It should be treated early. Under the combined influence of the various methods of treatment that are used for paralysis, it is oftentimes very much relieved. Sometimes perfect cures result.

Shaking palsy is a familiar form of paralysis, that not unfrequently attacks old people. It is usually very obstinate to treatment. In some cases it may be relieved, and in some cases may be cured by electrization.

The insane are sometimes attacked by *general paralysis.*

Paralysis of various kinds may result, by what is called "reflex action," from diseases of the internal organs, as the bowels, or bladder, or womb.

TREATMENT OF PARALYSIS.

The treatment of paralysis is based on the same general principles as the treatment of nervous diseases in general. (See *Nervous Diseases.*)

Every case must, of course, be studied by itself. There are many cases that can be perfectly cured. Others can be greatly benefited. There are others still that can receive no benefit whatever.

It is for the physician to decide in which of these three classes—the curable, the relievable, or the incurable—any patient probably belongs.

The remedy which is now used for paralysis more perhaps than any other single remedy is *electricity. Electricity* has been used in the treatment of paralytic affections for more than a century.

All those physicians who give attention to the application of electricity to disease agree that it is useful in paralysis, however widely their opinions may differ on other particulars. (See *General Electrization* and *Localized Electrization.*)

Strychnine, phosphorus, are used for paralysis, both internally and by hypodermic (or subcutaneous) injections. (See *Hypodermic Injections.*)

Passive movements, with *rubbing,* are beneficial in paralysis. They may be used in conjunction with other remedies. Patients, or the friends of patients, may assist the physician in this way, provided they are so disposed; although it is much better, when it is practicable, to have these movements directed by some one who thoroughly understands his business.

Perseverance is extremely essential in the treatment of paralysis, whatever treatment may be adopted. Almost all cases take time and patient care. Oftentimes it takes many months to benefit or cure the patient.

The friends of patients are apt to expect too much from treatment in this affection. They expect that what they call a "shock" of electricity or a few doses of medicine will restore complete motion to limbs that have been paralyzed for months and years. All such expectations are absurd. Paralysis is frequently the result of diseases of the brain or spinal cord, that have been years coming on; it is not rational to expect that these diseases will be cured in a day or in a week. Nature does not work in this way. *The rule is, that diseases which have been a long time coming on must be a long time in recovering.*

Another great mistake of patients is to delay too long *before consulting advice.* Parents allow their children to be paralyzed for years, and then expect their physician to perform a cure in a week.

Patients give as a reason for their delay that they have no hope of relief. This also is a mistake. Paralysis, if *taken in time*, is frequently as relievable and as curable as other nervous diseases.

In most of the paralyses of the limbs the muscles in time shrink, and the limbs become smaller. The paralyzed limbs may be from one to a number of inches smaller in circumference than those which are healthy.

One great advantage of treatment by electricity and movements is, that it exercises the muscles, keeps them in activity, and thus retards the process of shrinking and waste.

PAREGORIC ELIXIR.

Paregoric elixir is prepared in the following manner: "Take of camphor two scruples and a half; hard opium, powdered, and benzoic acid, of each seventy-two grains; oil of anise, a drachm; proof spirits, two pints; macerate for fourteen days, and strain." This remedy is much used in chronic asthma, and cough, when no inflammatory symptoms are present. A teaspoonful of it may be taken three or four times a day, and two teaspoonfuls at bedtime. Half an ounce of this elixir contains a grain of opium.

PEPSIN.

This is a preparation made from the stomach of the calf. It is supposed to contain the active principle of the gastric juice, and therefore it is much given in *dyspepsia.* The wine of *pepsin* is a preparation that is highly recommended. The taste of pepsin nearly resembles that of old cheese. Pepsin has been recommended in the diarrhœa of infancy. The dose is from *two to ten grains.* It may be taken just before or just after meals.

PERCUSSION.

This is a method of examining the condition of internal organs by striking on the outside. This is done on the same principle that the farmer taps on the end of a cider barrel to know by the sound whether it is full or empty, or on a water-melon or pumpkin to learn whether they are rotten or sound.

Physicians percuss with their fingers, or with what is called the *pleximeter*. (See cuts.) By means of percussion it is possible to ascertain the condition of the lungs, the stomach, the liver, the spleen, and the bowels. Percussion detects consumption of the lungs, cancers of the liver, and tumors of the ovaries. To use it successfully requires experience. It is sometimes combined with auscultation. (See *Auscultation.*) These two methods of studying disease have wrought a great change in medical practice, especially of diseases of the chest.

PERMANGANATE OF POTASH.

This remedy has of late been much used as a *cleanser*. It may be used in this way:

Permanganate of potash, six grains,
Water, one ounce.

A few drops of this in half a tumbler of tepid water make an excellent injection for the nasal passages. (See *Catarrh.*) It is also used for chronic ulceration of the ear, and for inflammation of other mucous membranes. It is said to be good internally for *diabetes*, when there is no sugar in the urine.

PERUVIAN BARK.

Peruvian bark, or Cinchona, is commonly termed *bark* by way of pre-eminence.

Bark, or the sulphate of quinine, is deservedly considered the most valuable tonic medicine we possess, and has a wonderful power in checking all periodic or intermitting diseases; the latter effect is more especially shown in ague, in which it acts almost as a specific, and also exercises, when properly managed, a powerful influence in subduing the remittent fevers of warm climates.

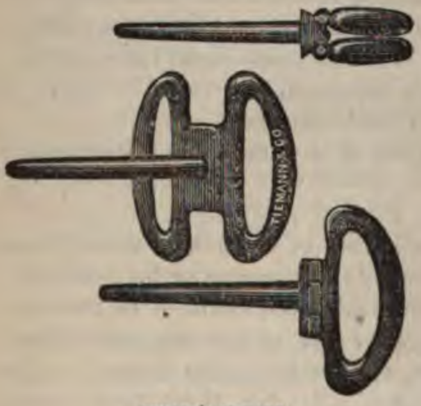
All the preparations of bark are to be withheld in inflammatory diseases, and in all disorders complicated with an inflammatory condition of the alimentary canal.

The facility with which small doses of sulphate of quinine can be taken has led to the substitution of this preparation for that of the bark in powder, which is objectionable on account of its nauseous taste, bulk, and from the woody fibre and inert matter contained in it rendering it indigestible and oppressive to the stomach. The ordinary dose of the powder is half a drachm, three times a day, mixed with wine and water; but in urgent cases it may be taken to the extent of one or two ounces in the course of twenty-four hours. The dose of the sulphate of quinine is from one to six grains, three times a day. In many cases we have known larger doses to cause buzzing, ringing, and other noises in the ears, giddiness, deafness, confusion of ideas, and other symptoms of cerebral excitement; and even grain doses administered during convalescence from fever, dysentery, and other acute diseases, sometimes produce this affection of the head. The brain is more especially excited by this remedy, even in small doses, when administered as a tonic in chronic dysentery. Quinine, from its excessively bitter taste, is usually given in the form of pill, made up with a little crumb of bread or mucilage. It is also frequently given in a liquid form; but as it is not very soluble in water, a little spirit, or a few drops of the *elixir of vitriol* (*aromatic sulphuric acid*) are generally added to increase its solubility.

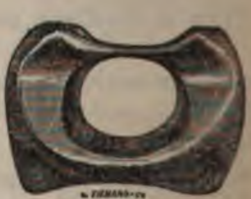
The *cold infusion of bark* is a useful tonic in indigestion, and is in many cases more grateful to the stomach than quinine; it is prepared in the following manner. Take of Peruvian bark, bruised, an ounce; boiling water, a pint; macerate for six hours in a vessel lightly covered, and strain. A wine-glassful to be taken as a dose three or four times a day.

The *tincture of bark* is sometimes taken as a stomachic in the dose of two or three teaspoonfuls. Many people residing in districts where they are constantly exposed to the influence of malaria from decaying vegetable matter, take this tincture habitually with the intention of keeping off fever.

PESSARIES.



CONANT'S PESSARY.



HOFFMAN'S PESSARY.

Pessaries are contrivances of various shapes employed to keep the womb in position, when through any cause it has become misplaced. Specimens of these are represented in the accompanying cuts. They should only be used under the direction of a medical adviser.

PETROLEUM.

Petroleum, and kerosene that is made from petroleum, are sometimes applied to inflamed joints in rheumatism. Good results have been claimed.

PHOSPHATE AND PYROPHOSPHATE OF IRON.

These preparations of iron are now taking the place of the much used tartrate of iron and potash, *iron* by *hydrogen.* They are given on the theory that phosphorus is a good tonic for the nerves, and iron for the blood.

(For doses of the different preparations of iron, see list of medicines at the end of the book.)

PHOSPHORIC ACID.

This is a most agreeable and efficacious method of administering phosphorus. Given in doses of from *five to twenty drops* in sweetened water, it is to some almost as palatable as lemonade.

It will be taken readily by those who would utterly refuse pure *phosphorus*, or even *pyrophosphate of iron.* It is an excellent tonic in dyspepsia and the nervous diseases.

PHOSPHORUS.

Phosphorus is a remedy of great power and great utility It is at the present time very much used as a tonic in diseases of the nervous system. (See *Nervous Diseases.*)

The pure phosphorus is an unpleasant remedy to give. Both the odor and the taste are disagreeable. It is, however, prescribed by physicians in doses of from *one-thirtieth to one-quarter* of a grain in sweet oil. The remedy has a special influence on the sexual organs.

Phosphorus is usually given in the form of the hypophosphates of soda, lime and potash (see *Syrup of Hypophosphites*), *pyrophosphate of iron* and phosphoric acid. (See *Phosphoric Acid.*)

PILES.

Piles are small painful tumors situated at the extremity of the great gut called the *rectum*, either within the anus or fundament, or around its margin. In popular language, these swellings, when situated within the gut, are termed *internal piles ;* when beyond the verge of the anus, *external piles ;* and when there is no discharge of blood they are usually called *blind piles.*

There are two kinds of piles, differing from each other in structure The *first kind* is formed by dilatation of the veins of the anus; in those which are external, the veins are covered by thick indurated cellular substance, and the skin surrounding the verge of the anus; the internal are also covered with dense cellular tissue, and by the mucous or lining membrane of the gut. In the *second kind* the piles are soft, spongy, and not composed of enlarged veins, but of numerous minute vessels interwoven with each other. When irritated, they increase in size, become hard, and blood is exuded from innumerable points on their surface; whereas in the first kind the hemorrhage takes place from the bursting of the vein, and the blood flows in a stream. Some authors describe other varieties of piles, but they appear to be only modifications of the kinds above described.

Causes.—The causes which induce piles are numerous. The principal of the *predisposing causes* are, a plethoric habit of body, a melancholic, bilious temperament, hereditary disposition, hot and variable climates. Piles are seldom met with before puberty, and women are most frequently affected with them after *the turn of life.* Sedentary occupations and indolent habits, conjoined with full generous diet and the habitual use of wine, malt liquor, spirits, &c., induce a state of general plethora, and more especially fulness of the blood-vessels of the abdomen. In such cases the discharge of blood from piles is merely a salutary effort of nature to relieve the system, and is to be considered as one of the means which nature makes use of to maintain the balance of the various functions of the animal economy, which numerous circumstances, even during the most satisfactory state of health, tend constantly to disturb.

The chief *occasional causes* are: constipation of the bowels, which is by far the most frequent; pregnancy; large or too often repeated doses of purgatives. This disease is also brought on by long sitting; hence it is common among tailors, shoemakers, &c.; by sitting on the damp ground, wearing tight stays, and various causes which tend to obstruct the circulation of blood in the abdomen, and irritate the lower part of the rectum.

Piles at first give very little trouble, and seldom protrude, unless the bowels have been neglected, or the person has been indulging more than usual at table. Under such circumstances they become slightly painful, with a sensation of heat and itching at the anus. These symptoms may be soon relieved by attention to diet and regimen, and regulating the bowels by suitable doses of the above electuary. A laxative in common use in such cases is composed of equal parts of cream of tartar and sulphur, made into an electuary with syrup or molasses; the ordinary dose of this is a large teaspoonful at bedtime. The patient should pass his motions at night, just before going to bed. *This is an important part of the treatment, and ought never to be neglected.*

Other means besides the above may be employed with advantage to remove piles which have arisen from occasional or accidental causes. Sir B. Brodie and several of the best French authors recommend an injection of half a pint of cold water every morning after breakfast. The following astringent ointment is very generally used, but perhaps the best local application is a saturated solution of *alum:*

Powder of oak galls, an ounce,
Elder ointment, or hog's lard, the same quantity. Mix.
The piles and anus are to be anointed with this night and morning.

Washing of the parts should be resorted to after each evacuation from the bowels, and Mr. Mayo suggests that they should be washed with yellow soap and water.

When piles come on spontaneously, and have become constitutional, giving out blood periodically, they are in a manner necessary, and act as a safety-valve for the relief of the overloaded circulation, and thus serve, in a great measure, to protect the system from gout, internal hemorrhage, apoplexy, and other dangerous diseases. Hence it is obvious that in many cases it would be dangerous to interfere with bleeding piles, more especially when the habits of the individual are such as to render an outlet of this description necessary.

Piles frequently become so troublesome that the patient is desirous of getting rid of them at all hazards. There are two methods of removing piles; the one is by *excision*, and the other by ligature. The former is always preferable when the piles are external, the latter when they are internal.

PLASTERS.

Plasters are made of gums, fats, wax, resins, oils, and other substances.

They are spread on muslin, linen, or leather. They are usually more or less hard, but are warmed by the heat of the body, so that they firmly adhere. They support weak and neuralgic parts, relieve the pains of rheumatism and neuralgia, and act as mild counter-irritants. (*For rules for making, etc., see Prescriptions.*)

PLEURISY.

This is an inflammation of the pleura, a painful disease of very frequent occurrence, though rarely fatal when not complicated with other diseases. At its commencement the blood-vessels immediately under the inflamed portion of the pleura become distended with blood, and form a kind of network of a bright red color. The natural secretion from the affected part is at first supposed to be considerably diminished; but an overflow of thin serous liquid soon takes place, and, if the inflammation increase, the fibrinous part of the blood which, in a state of health, nourishes and sustains the pleura, is also thrown out, and forms in solid films or layers upon its surface, or is mingled with the effused liquid which has accumulated in the side of the chest affected. This excessive secretion sometimes continues until the side in which the inflammation is seated becomes completely filled with liquid, and the lung is in consequence so compressed that it ceases to perform its function. The inflammation, however, may attack both sides of the pleura (double pleurisy); but this is comparatively a rare occurrence.

Pleurisy commences with a slight degree of chilliness, sometimes with severe rigors or shivering. The patient, either at the same time or shortly after, complains of an acute cutting pain (*stitch*) below the nipple, or towards the anterior edge of the arm-pit, which occasionally catches or interrupts the breathing. The ordinary series of feverish symptoms soon follow, viz. hot, dry, and harsh skin, thirst, high-colored urine, and a firm hard pulse. Yet cases frequently occur where it is small, soft, sometimes unequal or intermittent, and closely resembling that which results from great debility; while the patient is at the same time laboring under much oppression and tightness at chest, accompanied by distressing anxiety. Now, if this oppressed state of the system were mistaken for real debility, and stimulants administered, all the symptoms would be aggravated, and serious consequences might accrue. But these symptoms, instead of being the result of direct debility, indicate the violence of the inflammation; the acute pain prevents the patient from breathing freely, and the constantly impeded respiration causes obstruction in the lungs; part of the blood, therefore, only reaches the heart, and consequently the quantity in general circulation is greatly diminished. Every time the patient coughs, or attempts to draw in a full breath, the pulse becomes suddenly full and hard.

Cough is a symptom which is always present in every inflammatory affection of the lungs; in ordinary cases it is brought on each time the patient endeavors to take a deep inspiration, and when the inflammation is severe, is induced by speaking, or even by moving the chest. In pleurisy the cough is short, dry, and very painful; and the expectoration is scanty, a little whitish, or transparent.

The patient generally lies on the back; but, at the early stage of the disease, sometimes on the sound side. In the chronic form the patient lies on the back, or more frequently on the side affected, because the weight of the liquid would impede the motion of the healthy lung if the patient lay upon that side.

In mild cases, or when active treatment has been adopted at the commencement, and only a small quantity of liquid is effused into the chest, recovery takes place in a few days; but when the accumulation of liquid is considerable, the disease may continue from one to three months.

There is a form of pleurisy frequently met with which is at first attended with pain and slight feverish symptoms; but afterwards slight cough, difficulty of breathing, and an uneasy sensation at the chest are the only symptoms experienced by the patient. In some cases no pain is felt at any period of the disease, and the cough, difficulty of breathing, &c., are so slight as scarcely or not at all to be observed. This latent species of the disease comes on sometimes during convalescence from fever, and there is often a considerable accumulation of liquid before any affection of the chest is suspected. Many people who are supposed to die from old age perish from this latent form of pleurisy.

When pleurisy declares itself in the usual way, and active treatment is adopted at the commencement, recovery generally takes place; but when the subjects of the disease are children, or people far advanced in life, it often proves fatal.

Pleurisy usually arises from cold and wet; but it may be brought on by any of the causes which give rise to inflammation of the lungs.

For treatment of pleurisy see *Treatment of Lung Fever.*

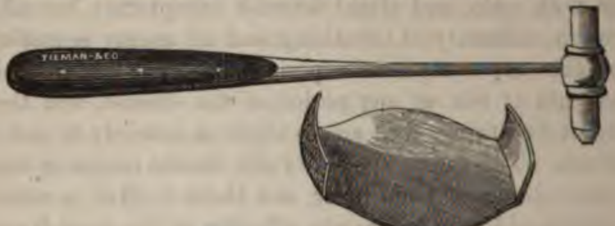
PLEURODYNIA, OR FALSE PLEURISY.

This is a rheumatic affection of the muscles of the side or chest. By those who do not understand the art of auscultation and percussion (see *Auscultation*, *Percussion*, and *Stethoscope*) *false pleurisy* may be, and often is, confounded with real inflammatory pleurisy. False pleurisy closely resembles neuralgia of the side of the chest. The difference between them is almost as important as the difference between real croup and false croup. The great difference between them is this, that in true pleurisy there is inflammation of the pleura, with effusion of fluid. This fact the physician ascertains by examination of the chest. In false pleurisy there is no inflammation of the pleura, and consequently no effusion of fluid. This fact of the absence of fluid the physician also ascertains by the examination of the chest.

The treatment of *false pleurisy* is very simple. *Relieve the pain by plasters of belladonna, or opium, or by spongio-piline.* (See *Spongio-piline.*) The disease will soon recover. *Neuralgia* of the side of the chest closely resembles false pleurisy: it is to be treated like neuralgia in general. (See *Neuralgia.*)

PLEXIMETER AND HAMMER.

The pleximeter and hammer are used by physicians in percussion. (See *Percussion.*) Many physicians prefer their fingers to any form of artificial pleximeter, just as many prefer the direct application of the ear in auscultation to any form of stethoscope. (See *Stethoscope.*)



PLEXIMETER AND HAMMER.

PODOPHYLLIN, OR MAY APPLE, OR MANDRAKE.

This has recently come into use as a substitute for *calomel.* It is believed to act upon the liver more potently than calomel, and with far less injurious effects on the system. It does not produce salivation. It does, however, produce nausea and vomiting when given in large doses. Some patients are so susceptible to it that even a small dose will produce great prostration. Podophyllin has a bitter taste, and in that respect is certainly inferior to calomel, which is almost tasteless. Podophyllin enters into the composition of many of our cathartic pills. It is said that *common salt* increases its cathartic effects.

The dose is from *one-half* a grain to two grains. Larger doses may produce vomiting and prostration.

POISONOUS WOUNDS.

The treatment of poisons taken internally is described under *Surgical Accidents and Emergencies*, to which section the reader is referred.

Under the head of *poisonous wounds* I include the wounds made by poisonous *serpents*, *insects*, *spiders*, *fish*, *mad dogs*.

The course to be pursued when bitten by a poisonous snake is as follows:

1. *To remove the poison from the wound.*—Pass a ligature, a cord or handkerchief *tightly* around the limb, as near to the wound as possible, and *between it and the heart.* Then, if possible, cut the poisoned part entirely out. Then *suck* the wound with the mouth or apply a cup over it. (See *Dry Cupping.*) Then cauterize it with a stick of lunar caustic (*solid nitrate of silver*), or with a red-hot iron, if the patient will bear it.

2. *To combat the effects of the poison.*—For this there are several methods of treatment. One is to make the patient *completely drunk* with brandy or whiskey. Favorable results are reported from this treatment. Other stimulants, such as hartshorn (ammonia), may be given at the same time. The wound should be bathed in ammonia.

Another method of treatment is by giving large emetics, in sufficient doses to thoroughly vomit the patient.

Another remedy is the following:

Iodide of potassium, four grains,
Corrosive sublimate, two grains,
Bromine, four drachms.

Ten drops of this mixture are given in a tablespoonful of wine or brandy. The dose may be repeated if necessary.

In addition to all these other remedies it may be well to try the effect of the electric currents through the chest, and *artificial respiration.* (See *Surgical Accidents and Emergencies.*)

Poisonous wounds made by insects are to be treated as follows:

Apply hartshorn, or cologne water, or vinegar directly to the wound. A poultice of *ipecac* has been recommended for the same purpose.

This is all the treatment that is needed for the bites of *wasps*, *bees*. Sometimes a person may be stung by a great many bees or wasps at once. In such cases fainting may be produced, and the patient will need internal stimulants—hartshorn, wine, brandy, or some liquor. Some persons appear to be more susceptible to poisons than others.

Poisonous wounds made by *spiders*, *centipedes*, and *scorpions* are treated in the same way as those made by insects—that is, by the direct application of hartshorn to the wound, and, when necessary, internal stimulants.

Poisonous wounds made by the horns of the so-called "horn-pout" of the Southern waters are best treated by thrusting a sharpened stick of lunar caustic directly into the puncture made by the horn of the fish, and as speedily as possible and as *early as possible*. This treatment always cuts short the inflammation and irritation that the wounds from these fish are apt to produce. While acting as surgeon on the blockade I had many opportunities of testing this treatment on myself and others. The sailors were accustomed to while away the dull hours of the blockade by catching these "*horn-pout*," and more or less were bitten almost daily. The poison of these fish is, of course, not very powerful, but is sufficient to excite painful and sometimes alarming swelling.

(For treatment of the poison of the common ivy; see *Skin, Diseases of*.)

POLITZER'S EAR INFLATOR.

This consists of a rubber bag and a rubber tube, with a nozzle. It is used by surgeons to inflate the middle ear through the nose. (See cut of ear, and *Ear, Diseases of*.) By means of the inhaler, which has been connected with this inflator, it is possible to send vapors of iodine and other substances through the nostrils into the middle ear.

This little contrivance, though very simple, is of very great service in the treatment of diseases of the ear, especially those which result from catarrh (see *Catarrh*) by extension of the inflammation from the throat to the ear.

Centiped. Page 760.

Scorpion. Page 760.

Mad Dog. Page 656.

Black Spider (Tarantula). Page 759

Rattle-Snake. Page 759.

POTASH, CARBONATE OF.

The bicarbonate, or, as it is commonly called, carbonate of potash, is sometimes used in indigestion, to correct acidity, to prevent the formation of lithic acid or red gravel; and for the latter purpose it is frequently employed in gout, which, as we have already had occasion to mention, is frequently complicated with the formation of red gravel. When it is found necessary to administer effervescing draughts to relieve irritability of the stomach, many practitioners prefer this salt to soda. The effervescing draught in common use is made by dissolving a scruple of the bicarbonate of potash in water, and then adding fifteen grains of citric acid, or the same quantity of tartaric acid, or three drachms and a half of lemon juice. The dose of the bicarbonate of potash is from ten to thirty grains three times a day. There are a number of salts of potash.

POTT'S DISEASE. (See *Spine*, *Diseases of.*)

POULTICES (CATAPLASMS.)

Poultices are used for the purposes of warmth and moisture. They are made of a variety of substances—*bread and milk*, *yeast*, *flax-seed*, *oatmeal*, *carrot*, *Indian meal*, *mustard*, *charcoal*, *onion*, *arrow-root*, and so forth.

The general rule for making them is to mingle the substance—whatever it may be—with sufficient hot water to make a mass sufficiently thick and soft. It is not necessary to weigh or measure the ingredients. Poultices are sometimes medicated by mingling with them a little *laudanum* or *belladonna*, or other anodyne, in order to relieve the pain. Poultices are used for *boils*, *abscesses*, *ulcers*, *gangrene*, and as counter-irritants. Spongio-piline is a very neat and convenient form of poultice. (See *Spongio-piline.*)

PRUSSIC ACID.

This acid, in its concentrated state, is the most powerful and rapid poison known. When prepared for internal use, it is given in the dose of from three to ten drops, three times a day, in sugar and water; and has been found very useful as a sedative in asthma, hooping-cough, chronic bronchitis, at the commencement of consumption, in some forms of indigestion, in allaying nervous palpitations, more especially when caused by a disordered state of the digestive organs. In running tetter and some other diseases of the skin, accompanied with severe itching, the following lotion is said to be useful:

Prussic acid, two drachms,
Acetate or sugar of lead, sixteen grains,
Alcohol, half an ounce,
Distilled water, eight ounces. Mix.

PUERPERAL OR CHILDBED FEVER.

This is the name given to a very dangerous inflammatory disease, to which women are liable shortly after delivery. It assumes two forms; the *first* is purely inflammatory, the *second* is accompanied with typhoid symptoms. In both varieties the inflammation is seated in the peritoneum, or serous membrane, which lines the cavity of the abdomen, and envelops the various organs contained in it. The whole or only a part of this membrane may be affected, and sometimes the substance of the womb and its appendages are inflamed.

The *first variety* commences with general shivering, or merely a sensation of chilliness in the back and loins. In either case the feeling of cold is soon followed by heat of surface; full hard pulse, sometimes not quicker than natural, but generally varying from a hundred to a hundred and ten beats in the minute; headache, great restlessness, and other symptoms of general excitement, attended by pain and swelling in the whole or part of the abdomen, according to the extent or progress of the disease. The discharge called the *lochia*, or in popular language, the cleansings, which always follow delivery, is commonly checked, but sometimes it continues to flow as usual. The breasts become flaccid, and if the milk have begun to flow, it is dried up, but the disease generally commences before this secretion is established. The patient lies on her back, with the knees raised upwards towards the belly; this position being found the least painful, inasmuch as it slightly relaxes the inflamed peritoneum.

This alarming disease generally makes its attack about the third day after delivery, sometimes on the first, and often not until the sixth day, or even later. It is always the more dangerous the earlier it commences. By energetic treatment it may be subdued in the course of a few days, the pain and swelling subside, the appearance of anxiety and distress so strongly depicted in the countenance gradually wears off, and the woman quickly recovers: or it may be prolonged from eight to fifteen days, and then terminate favorably, or pass into a chronic state, from which the patient very seldom recovers. In many cases the symptoms progress with frightful rapidity, the belly becomes enormously distended, the inflammation extends to the peritoneal covering of the stomach, vomiting supervenes, and the patient dies delirious and in great agony. It occasionally happens, after a longer or shorter period of severe suffering, that the pain subsides, and the patient becomes perfectly quiet and composed. This deceitful calm indicates the near approach of death.

In the *second*, or *typhoid variety*, the shivering is severe and long continued; the headache is intense, and accompanied, even from an early period, with constant low delirium, which is in most cases preceded for a short time by drowsiness and listlessness; the latter symptom is shown more particularly by the patient becoming careless about her child. The pulse is small, hard, and exceedingly quick, being from 130 to 160 in a minute; the higher it is the greater is the danger. The skin is hot and dry, whereas in the former variety it is generally moist; the face is pale and contracted, there is great prostration of strength, and frequently vomiting and purging.

Causes.—Childbed fever may be caused by violence during delivery, exposure to cold, premature exertion, agitation of mind, errors in diet, or the imprudent use of stimulants; and it sometimes prevails as an epidemic.

Treatment.—It is supposed that half the women who die in childbed fall victims to puerperal fever; *but the mortality would not be nearly so great if medical aid were procured at an early period of the disease*, for it is only within the first twenty-four hours that much confidence can be placed in remedies. It cannot, therefore, be too strongly impressed upon the minds of the friends and attendants of childbed women, that medical counsel should be sought at the very onset of this formidable malady, for, from the moment the first symptoms are manifested, the woman's life is in peril, and this will be increased by every hour's delay.

The violent character of childbed fever, the rapidity of its progress, and the little control which the physician has over it, show the great importance of adopting measures to prevent its occurrence. Regular exercise ought to be taken during the last months of pregnancy, and the bowels should be carefully kept open by the occasional use of a dessert-spoonful of *lenitive electuary*, or mild doses of fine East India *castor-oil*. If the woman be robust and full-blooded, the abstraction of a moderate quantity of blood from the arm is a necessary precaution, if not forbidden by peculiar circumstances. Two or three hours after delivery the infant shoul be allowed to take the breast, and this practice should be continued during the first fortnight, even if the mother have no intention of suckling the child herself. She ought to remain in bed during the first nine days, and not quit her apartment for a fortnight.

PUERPERAL MANIA.

"The period at which this mental disease appears is various; but it is seldom, if ever, sooner than the third day, often not for a fortnight, and in some cases not for several weeks after delivery. It usually appears rather suddenly, the patient awakening, perhaps, terrified from a slumber; or it seems to be excited by some casual alarm. She is sometimes extremely voluble, talking incessantly, and generally about one object; supposing, for example, that her child is killed or stolen; or, although naturally of a religious disposition, she may utter a succession of oaths with great rapidity. In other cases she is less talkative, but is anxious to rise and go abroad. In some instances the patient recovers in a few hours, in others the mania remains for several weeks, or even some months; but I believe it never becomes permanent, nor does it prove fatal unless dependent on inflammation of the brain."

Treatment.—Puerperal mania is a disorder of the nervous system. The treatment consists in keeping the patient as quiet as possible, in opening the bowels occasionally by mild laxatives, in keeping the head cool by the application of eau de cologne and water, vinegar and water, or any other simple cooling lotion. Mild anodyne remedies are useful in soothing the patient and preventing restlessness during the night. The *bromide of potassium* may be of service. The diet should be light and nutritious. The secretion of milk should be stopped by removing the infant from the mother. But in this disorder, which is seldom dangerous, time and careful nursing are more to be relied upon than medicine.

PULMONARY CONSUMPTION.

Consumption is caused by the deposition of scrofulous matter in the substance of the lungs. The deposition takes place in small granules, called tubercles, which are of a dull white or yellowish color, of firm consistence, slightly transparent, varying from the size of a small pin's head to that of a garden pea or a small hazelnut, and disseminated more or less extensively through the lungs; but they are almost invariably more numerous, larger, and more fully developed towards the upper and back part than at the base.

The progress of the disease, therefore, is usually from above downwards. In their earliest stage these little bodies are distinct from each other, but as they increase in size and number they coalesce, so as to form thick opaque masses of a yellow color and of considerable size. These small tumors at length soften, and acquire the consistence and appearance of matter (pus); they communicate with each other, and the matter finds its way into the bronchial tubes or air-passages, and passes off by expectoration. Each mass or cluster of tubercles, after reaching a certain size, undergoes the same change, and the cavities necessarily produced by the evacuation of the matter tend to run into each other, in consequence of the gradual development and softening of surrounding portions. The openings formed are at first small, but the softening of tubercles forming the walls of the cavities goes on gradually until a free communication takes place. The excavations thus produced vary in size; sometimes they are not larger than a pea, at other times they might contain half a teacupful, or even a cupful of fluid; they may be seated deeply in the substance of the lungs, or may approach the surface so as to be bounded only by the pleura, or enveloping serous membrane. The walls of the cavities constantly secrete matter, and portions of them gradually become detached. Sometimes the surrounding substance of the lungs remains sound, but in general it becomes more or less impervious to air; and before the patient dies it is supposed that on an average three-fourths of the whole texture of the lungs are rendered incapable of carrying on the function of respiration.

In the *first stage* of consumption the principal symptom is cough, which at first occurs only on rising in the morning, and is little noticed; but after some time it becomes more or less troublesome during the day, particularly after going up stairs or on taking ordinary exercise, but for a considerable length of time is not accompanied by expectoration.

Cough is a *symptom* of some trouble of the air-passages or of the lungs. It is by no means necessarily a bad or dangerous symptom. It may be caused by trouble in the larynx, or even in the pharynx, as well as by bronchitis or consumption, or any other affection of the lungs.

Cough is simply an effort of nature to get rid of some irritation. The cough is not the *disease,* as many suppose; it is nature's method of relieving us somewhat of the irritation of disease. It is bad to cough; it might be worse oftentimes not to cough.

At length the patient begins to expectorate a thin, whitish, semi-transparent mucus resembling saliva, and this is observed to be more copious on getting out of bed than during the day. A sensation of constriction now begins to be felt at the chest, and is at times attended with slight difficulty of breathing. After a longer or shorter period the general health commences to give way, a slight degree of shivering is experienced occasionally, and is followed by restlessness and heat of the skin, more especially of the palms of the hands and soles of the feet, terminating in slight perspiration. As the disease gains ground the patient becomes gradually emaciated, and is unfitted for much bodily or mental exertion. His face is sometimes flushed, at other times pale. The pulse is considerably quickened, and the face appears flushed after eating, or any bodily exertion. Lassitude soon follows, and the countenance assumes a peculiar expression of languor and fatigue. The patient feels at times chilly, and cannot bear cold as formerly; he is restless during the night, and sometimes awakes with his chest or the calves of his legs bathed in perspiration; and in many cases the hair loses its strength and falls off. At this period the tubercles are interspersed to a greater or less extent through the substance of the lungs, but are still grayish and semi-transparent.

The *second stage* commences with softening of the tubercles, and is manifested by a decided change in the appearance of the expectoration, which is now whitish, opaque, and does not run together in masses, but is seen in detached portions, of a round form, with irregular indented edges, and floating in the thin transparent liquid secreted by the lining membrane of the air-passages. During this stage, sometimes at an earlier period, spitting of blood, which is one of the most marked symptoms of the disease, generally takes place. This may be slight, from a few streaks of blood to a spoonful, or it may be to the extent of a pint or more. In some instances the patient is seized with spitting of blood while enjoying apparent health, and this may be the first symptom which he observes. Blood sometimes comes from the mouth or throat, or spitting of blood may be caused by deranged menstruation, or by local injuries. But it rarely happens that blood comes from the lungs, unless the patient be consumptive. The cough is now greatly aggravated, and is troublesome during the night; the pulse is permanently quicker than natural, and ranges from ninety to one hundred and twenty beats in the minute; hectic fever becomes confirmed; the debility and emaciation increase; the face is pale during the day and flushed in the evening; and pains resembling rheumatism are felt at the shoulders and chest.

In the *third stage* all the symptoms already enumerated increase, the rigors or chills in the evening are severe, the consequent heat of the surface of the body, thirst and restlessness, are very distressing, and the morning perspirations more profuse. The cough occurs more frequently, and is followed by breathlessness; the voice becomes more or less hoarse or indistinct; the slightest exertion increases the difficulty of breathing, and many patients suffer severely from pains in the chest. The expectoration is now very copious, and assumes a yellow color, with a dirty grayish tinge and nauseous smell; it no longer appears in round masses with indented edges, but runs together, still appearing unmixed with the thinner liquid. Frequent purging also harasses the patient, and tends greatly to increase the debility and emaciation; the ankles begin to swell in the evening, and after some time remain permanently swollen. Some patients suffer comparatively little towards the termination of the disease; they waste away gradually until the powers of life are completely exhausted, and death takes place without a struggle. In other cases, again, the hectic fever, difficulty of breathing, and frequent cough, followed by a sense of suffocation and sinking, are severe to the last.

The duration of consumption varies greatly in different individuals; sometimes it commences almost insensibly, progresses very slowly, and passes through its different stages almost without either fever or cough; this latent form of the disease is common in children, and in persons far advanced in life. In other cases, again, the tubercles are extensively disseminated through the substance of the lungs, and the disease declares itself abruptly; the fever and prostration are sometimes so intense and the emaciation so rapid that the patient sinks in the course of a few months. This form of the disease is known to the public at large under the denomination of *galloping* consumption, and occurs more frequently in women than in men. It often happens that consumption advances slowly during a year or two, or even considerably longer; then becomes suddenly developed, and terminates fatally in a very short time. In such instances a slight cough is perhaps the only symptom particularly noticed by the patient or his friends, until he is suddenly seized with shivering, followed by a considerable degree of fever, with oppression and difficulty of breathing; and on examining the chest the physician now discovers that the disorder has advanced beyond the reach of our art. In cases of this description, it is more than probable that tubercles had long existed in the lungs in a latent state, and that the softening process had commenced suddenly in a great many of them at the same time, giving rise to fever and the usual symptoms of the disease in their most intense form.

Sometimes the symptoms of consumption appear to intermit;

they cease during summer, and the friends of the patient are led to believe that there is no longer any cause for alarm; the following winter, however, brings back the symptoms, which again disappear almost entirely when the weather becomes mild; these changes, perhaps, take place during several years before the disease becomes fully developed.

The duration of consumption depends greatly on the circumstances of the patient. Those who have it in their power to avoid all the causes which tend to aggravate the disease are, of course, more likely to linger during a longer period than those who have not. The average duration of consumption is from twelve to eighteen months.

The first duty of the *consumptive is to find out whether he really has the disease or not. This question can only be answered by a competent physician.*

Many who are troubled by a cough arising from bronchitis ignorantly suppose that they have consumption, and when the cough leaves they represent to their friends ever afterward that they recovered from consumption.

The true way is to face our danger bravely; to have our lungs examined by a competent and honorable physician in *the early stages of the disease*, before it is too late to try remedial measures.

If our lungs are not affected, it is a gratification to know the fact; if they are affected, it is important that we should be informed in time. There is, therefore, every reason why we should, as soon as possible, have a reliable opinion concerning the condition of our lungs.

Causes.—Pulmonary consumption is generally admitted to be referable in all cases to one common origin, viz., that debilitated state of the constitution termed the scrofulous habit. This is more particularly remarkable in the hereditary transmission of consumption in scrofulous families, and in the frequent connection which exists between consumption and various symptoms and appearances of scrofula. The development of an external scrofulous abscess bears a strong analogy to the formation and progress of tubercles in the lungs. Both commence in the same slow, insidious manner, become solidified, then soften, and present the same kind of thick curdy matter. We also observe the same general symptoms—the hectic fever, the excessive sweating, the flushing of the face, emaciation, purging, &c., in scrofulous inflammation of the hip or knee-joint, as in confirmed consumption.

Although the tuberculous or scrofulous constitution, or that state of the system which precedes consumption, can generally be traced to hereditary origin, it may nevertheless arise from various causes, the principal of which are the following:

1. A cold, damp, and variable climate; hence consumption is of rather more frequent occurrence in countries which have wet and cold alternating with heat, than in those which have a dry atmosphere, whether cold or hot. This is illustrated by the frequency of the disease in England and in Holland; whereas within the tropics and in the northern part of Russia, where the atmosphere is dry, it is perhaps not quite so frequent.

2. Improper food. Diet composed of substances not sufficiently nutritious or stimulating, or an inadequate supply of food, tends strongly to produce consumption. Hence the disease occurs most frequently amongst the poor, and many consumptive individuals of this class of society attribute their illness to the privations they have undergone from want of food; and among the indigent, particularly in large towns, it is observed that women frequently become consumptive while nursing. On the other hand, among the more affluent classes of society, there is reason to believe that the disease is often induced by abstaining from nutritious food, through false theories on the subject of diet. (See *Food.*)

3. Impure air. Some modern authors place this at the head of the causes of consumption, and there can be no doubt that it exercises a very pernicious influence on the animal economy. Breathing an atmosphere loaded with smoke, and polluted with numerous exhalations necessarily connected with the various processes of animal and social life, must tend greatly to increase the mortality of large towns, more especially among the working classes, who reside in narrow, dirty streets, lanes, confined courts, and similar localities, where the ventilation is imperfect, and the vivifying rays of the sun are excluded. (See *Air* and *Sunlight.*)

4. Excessive labor. This cause depresses the energies both of the physical and moral system; and whatever tends to debilitate the body tends also to induce consumption.

5. Deficient exercise must also rank among the causes of consumption.

6. Certain occupations. The sedentary occupation of literary men, tailors, shoemakers, weavers, dressmakers, &c., conjoined with want of pure air, induce that state of the constitution of which consumption is to be considered as the local manifestation. This disease also appears to be frequently brought on by certain trades, which expose the workmen to an atmosphere loaded with irritating gases, and minute particles of various

substances. (See *Influence of Occupations on Health and Longevity.*)

TREATMENT OF PULMONARY CONSUMPTION.

Those who are afflicted with pulmonary consumption should remember these facts:

1. *The disease is constitutional, and not simply local.* Therefore all the measures which merely affect the lungs and air-passages can at best afford only temporary relief.

2. *No specific has yet been found for this disease.* Whatever charlatans may advertise, whatever those who profess and who really believe that they have been cured of consumption by some particular nostrum may assert, the people should understand that no *specific* has yet been found for this terrible disease.

3. *Most of those who declare and who honestly believe that they have been cured of consumption really never had* the disease at all, but have simply recovered from bronchitis, or some other less serious affection of the air-passages. Very few patients can judge whether they have or have not consumption, and physicians themselves are liable to error, especially in recent and doubtful cases.

4. *Consumptives sometimes recover.* When they do not get permanently better their lives are oftentimes much prolonged. It has been estimated that the lives of consumptives have been quadrupled under the modern methods of treatment.

The first great thing in the treatment of consumption is AIR. The patient must be as much as possible out of doors. So far as possible, he should live in the open air, and exposed to the sunlight. (See *Air*, *Sunlight*, and *Exercise.*)

Next to air comes *nourishing food.* The consumptive needs plenty of *carbonaceous* food. He should therefore be encouraged to eat freely of beef, mutton, eggs, fish, and milk. If he properly observes the laws of health in regard to air and exercise, his appetite will usually be good, except, of course, in the last stages.

Next to *air* and *food* comes medicine. The medicines which are now found most useful for consumptives are *cod-liver oil*, *cream*, and *alcoholic stimulants.*

It is a mistake for patients to place too much dependence on medicine of any kind, for it is at best merely an aid to nature. Cod-liver oil may be taken in doses of one or two tablespoonfuls, two or three times a day. Some patients are unable to take it on account of its nauseous taste.

There are certain accompanying symptoms that may be relieved or mitigated, even though we cannot cure the disease.

The *night sweats* may be checked by the use of vitriol or aromatic sulphuric acid, with quinine.

The *cough* may be checked by opiates, although it cannot be prevented.

But the patient should be discouraged from taking the thousand and one expectorant medicines that are offered by sympathizing friends. They irritate the stomach, and rarely do any good.

PREVENTION OF CONSUMPTION.

Consumption is to be prevented on the same principles by which it is treated. Those who inherit a tendency to this disease, or who suspect that it may attack them, should give attention to the following points:

1. *Air, Exercise, and Sunlight.*—These three are the best antidotes of consumption that we know of. (See *Air*, *Exercise*, and *Sunlight* under *Hygiene.*) Sometimes it may be necessary to change occupation; but I dislike very much to compel patients to leave any occupation that they dearly love, and for which they have a positive taste, for one that they hate, and which is uncongenial to their tastes. I rarely advise one to leave a mental occupation for one which is purely muscular, unless the indications are very strong indeed.

2. *Abundant food, especially of meat.*—Those who have a tendency to consumption should live as generously as their purses will allow. They should have abundance of flesh. They should take fat meat, if they can make themselves enjoy it.

Consumptives make great mistakes when they refuse meat as a matter of principle, as some do, and confine themselves to vegetables and fruit. (See *Diet*, under *Hygiene.*)

3. *Special exercises to expand and develop the lungs.*—It is well to take full long breaths habitually, several times daily, from youth up to manhood. It is well to devote a little time, when we are dressing and undressing especially, to this very pleasant amusement of *slowly inflating the lungs to their utmost capacity, and then as slowly exhaling the air, at the same time standing erect and throwing the arms back.* This practice may be aided by holding small, light dumb-bells in the hands. Dr. H. G. Davis's method of expanding the chest by swinging from a bar may be used with benefit by those whose lungs are in a weak condition. Practice with the spirometer is also of advantage, provided it is guided by common sense.

It is undoubtedly possible to injure one's self by pursuing these methods of developing the chest too exclusively and too severely.

That they can be of great benefit to those who use them under the guidance of good common sense, there can be no question.

4. *Residence in a favorable locality.*—It appears from the statistics of Dr. Bowditch, that those who live in houses situated in low marshy places, where the *soil* is *damp*, are more liable to consumption than those who live in a dry soil. Dr. Bowditch states most emphatically, that in those towns of Massachusetts where the soil is dry, consumption is less frequent and less fatal than in those towns where the soil is moist. The difference in mortality from consumption between the different towns of Massachusetts is most surprising.

The same fact of the dependence of consumption on moisture of soil has also been observed in England. The question of a permanent change of climate must be determined by each individual for himself, and by the advice of his physician.

In preventing consumption, as in preventing nervous diseases, we should not depend on any *one* method of treatment, or any one system, but on all measures that have been proved to be beneficial.

Every necessary precaution should be taken to avoid danger from wet feet, sitting in currents of air, the long-continued influence of cold and wet, and sudden alternations of atmospheric temperature, as going out of hot rooms into the cold night air, or passing from the latter into heated rooms; but exposure to the open air at all seasons, when the body is protected by suitable clothing, and proper precaution is observed, improves the general health and strength, and tends strongly to fortify the system against the impression of cold; whereas confining phthisical persons in warm rooms during winter, and the adopting of other measures for the purpose of escaping the effects of a cold and variable atmosphere, have a tendency to debilitate the constitution, and, instead of counteracting the unfavorable influence of the climate, only render the invalid more subject to it, and thus produce the very opposite effects to those intended. Another powerful means of hardening the body so as to allow the invalid to withstand atmospheric vicissitudes, and render him capable of following his usual avocations, and enjoying the rational pleasures of life, is *cold bathing*. At first the tepid shower-bath may be used, or simple ablution of the trunk of the body by means of a sponge or a towel dipped in water, containing a portion of salt or vinegar (two ounces of either to a pint of water), and after the skin has been carefully dried, friction with the hair glove or a rough towel should be used. The time for using this process is immediately on getting out of bed. It is advisable in all cases, whether the shower-bath or sponging be employed, to begin with warm water, reducing the temperature gradually until it can be used quite cold. Either of these methods may be continued daily through the coldest winter, but the latter, being the least troublesome, is generally preferred. Both sexes should wear flannel next the skin, from the collar-bones to the ankles. It ought to be worn of a thinner texture in summer than in winter, *but never altogether discontinued.* Many young ladies bring consumption on themselves by deficiency in clothing, and wearing silk stockings and thin shoes during winter.

Dr. Mattocks thus remarks on the effects of climate upon the lungs:

"Dr. Bowditch, in his writings upon consumption, both for the profession and for the people, lays much stress upon dampness as the great exciting cause of consumption.

"While we do not claim that tubercle is deposited by a peculiar fungus, generated by dampness with cold, yet we do claim that where there is a damp cold climate, subject to sudden changes by reason of lake or marine winds, tubercle follows as surely as mould attacks clothing or damp wood.

"While pathology has not yet taught us conclusively the source or origin of this tuberculous matter, yet experience has taught us the condition of the system most favorable for its attack. Often a slightly congested lung by reason of cold, followed by imperfect recovery, may be the exciting cause, preceded in the great majority of instances by a lessened vitality, in consequence, perhaps, of a recent attack of illness, grief, or the depressing effect of poverty—all these reasons may predispose to the disease, accompany or hasten it, but a 'cold' lights the flame.

"As an illustration of our premises, I give below the census returns of 1860 of the deaths by consumption. The census in many of its details is incorrect, but for the purposes of comparison I find it mainly correct. As the death-rate is very different in many States, for more correctness of comparison I have estimated the number of deaths from the population of each State. For instance, in Massachusetts, for 1860, one person died with consumption in every 250 inhabitants:

"Maine	1 in 280
New Hampshire	" 280
Rhode Island	" 300
Connecticut	" 360
Vermont	" 400
New York	" 470
New Jersey	" 490

Delaware	1 in 550
Maryland	“ 570
Pennsylvania	“ 580
Michigan	“ 630
Kentucky	“ 660
Ohio	“ 670
California	“ 720
Virginia	“ 750
Indiana	“ 760
Tennessee	“ 770
Louisiana	“ 840
Wisconsin	“ 850
Illinois	“ 880
Missouri	“ 900
Iowa	“ 902
Kansas	“ 910
Minnesota	“ 1,139
North Carolina	“ 1,300
Arkansas	“ 1,322
Mississippi	“ 1,420
Texas	“ 1,430
Florida	“ 1,440
Alabama	“ 1,618
South Carolina	“ 1.720
Georgia	“ 2,150

“ *The ‘ sine quâ non ’ should be first a dry climate, and leave it to the judgment of the patient which he will choose, or rather which agrees with him the best—hot or cold.*

“ Some patients cannot stand the cold at all; it seems to *wither* them all up. These are, as a general thing, of a phlegmatic temperament, anæmic, and bloodless. They have no life, no vitality, and they seem to desire none; they want perpetual sunshine, with little stirring about them. Such, of course, should be sent South, if moved at all; generally there is but little to hope from such patients.

“As we prescribe for each case remedies suitable for *individual* cases, so should we prescribe a climate; ever bearing in mind that the same remedy given for the same disease oftentimes affects two persons entirely differently by reason of peculiar idiosyncrasies. This holds true as regards climate, perhaps in a more marked degree than in medicine, hence the necessity of a patient and careful examination into *all the circumstances* connected with each case; and by all means let it not be confined to the chest, but let age, sex, temperament, tastes, individual preferences, means, and general condition of health exert their influence on the mind of the physician before venturing an opinion as regards a change of climate."

Concerning the influence of climate on consumption Aitken thus speaks:

"The science of medicine is not unfrequently indebted to non-professional people for correcting prevailing errors of belief and establishing correct opinions. No one, perhaps, contributed more in this direction, in the discharge of his own professional duties, than the late Sir Alexander Tulloch. It was long a prevalent belief that consumption was limited by latitude, and that it never appeared in warm countries—for instance, south of the Mediterranean. But this is proved not to be the case; for the returns of the army, prepared by the above writer, have shown that phthisis is more frequent in the West Indies than even in this country—a statement first made by Sir James Clark in his work on climate, in illustration of the injurious effects of that climate on consumptive patients sent there from this country.

"According also to the recorded opinion of this author, great heat appears to have a powerful effect in predisposing to tuberculous diseases (probably by diminishing the exercise in the open air). That it is not the climate of the place which alone produces this result in the West Indies, is shown by the fact that officers were attacked in infinitely smaller proportions than private soldiers; and in consonance with the views entertained regarding the nature of tuberculosis, it is more than probable that crowded barrack-rooms, a restriction to salt diet, and drinking spirits may have produced the result.

"It would appear that England and Wales, the Cape of Good Hope, and the Ionian Islands are more exempt from phthisis than many countries which, from their higher temperature, have hitherto been supposed to enjoy a remarkable exemption from this complaint. The result of extended observation now entirely refutes the hypothesis, that paludal districts are in an eminent degree exempt from phthisis—an opinion first promulgated by the late Dr. Wells, and advocated by M. Boudin. England and Wales, the Cape of Good Hope, Canada, and Malta—countries either the driest or the best drained, and consequently suffering the least from paludal diseases—are actually those countries the most free from phthisis."

Concerning the relation of *dampness of the soil* to consumption, Dr. Bowditch speaks as follows:

"1st. Phthisis (consumption) is very unequally distributed in New England.

"2d. There are some places which enjoy a very great exemption from its ravages, if not quite as much exemption as any portion of the globe can claim.

"3d. There are some spots, nay, even particular houses, which are frightfully subject to it.

"4th. There is a cause governing this unequal distribution of the disease,—a law not recognized before these investigations, and still practically ignored by the majority of human beings, which, however, is one of the main causes, if not the sole cause, of the unequal distribution in New England, and possibly elsewhere.

"5th. This cause is intimately connected with, and apparently dependent on, *moisture of the soil*, on or near which stand the villages or houses in which consumption prevails."

On the subject of the contagiousness of consumption, the same authority remarks:

"During the last quarter of the last century there was great indecision on the part of the faculty, and many protested against this strong position. From the writings of that period it is evident that the idea of contagion had met a strong opposition, and finally, early in this century, an opinion the exact reverse of contagion was arrived at. Forty years ago scarcely any one believed in it, and Italy relaxed its strict rules. But within a few past years the belief in the contagiousness of tubercle, which is usually synonymous with consumption, has suddenly again sprung up in Germany, under the influence of experiments made by modern physiologists. Inoculations of tuberculous matter from men to animals have been made, and the disease has been reproduced in the animal. It is true that doubt has been thrown upon the real value of the experiments; and we think that doubt is a just one, because it has been found that any long-continued local irritation of an animal—as, for instance, the keeping up of a violently irritating sore on the body —may eventually excite tubercular disease. Moreover, the fact that tubercle inoculated—that is, put under the skin by means of an operation—produces consumption in an animal, is no valid reason for thinking that the emanations from the breath or skin of a tuberculous patient would certainly convey the disease from man to man. Still further, if the disease were really so contagious as some believe, why have not physicians and nurses and attendants at special hospitals for the lungs—as at Brompton, for example —been taken down by the disease?

"Briefly, we may say that medical opinion is at present much divided upon the topic of the contagiousness or otherwise of consumption. Few, if any, believe it to be equally contagious with small-pox and other kindred contagious diseases. Still medical opinion rather verges now towards the belief that the disease is at times capable of producing a like disease in others, unless precautions are taken by those who have the care of ministering to the consumptive. With these precautions we believe there is no danger; without them there is peril."

PUSTULE, MALIGNANT.

This is "the result of a specific poison, which produces, in the first instance, a redness like the bite of a gnat, and afterwards a minute vesicle.' A peculiar form of gangrenous inflammation is excited, which rapidly spreads from the point first affected to the neighboring tissues. Hardening and blackening of this part is extreme, and death of tissue is so entire that the part creaks when cut with a knife. No pain attends the incisions, crops of secondary vesicles form round an erysipelatous-like areola, chains of lymphatics become inflamed, the breath fetid, and death follows amid all the indications of septic poisoning."—*Budd, quoted by Aitken.*

This disease, though not common in this country, has long prevailed in various parts of Europe. It frequently attacks animals.

The disease may be communicated to man by eating the flesh of animals that were affected with it. On this subject, however, there is a difference of opinion.

It certainly may be communicated by immediate inoculation. Skinners, butchers, and drovers are likely to take it.

It may also be communicated to man by insects that have been in contact with the dead bodies of diseased animals.

There are those who believe that it may be generated spontaneously.

Treatment is useless unless it is commenced early. The remedies are cauterization with *potassa fusa* or *nitric acid*, and stimulants internally, with beef-tea and other nourishing food.

The disease is so rare in this country that probably few of my readers will ever see a case.

PYÆMIA.

This word literally means *pus in the blood.* It is a disease that is well recognized. It is sometimes called *septicæmia.* The disease is not fully understood. It usually proves fatal.

It probably results oftentimes from inflammation of the veins (*phlebitis*). Phlebitis may occur in different parts of the body. Very few people would be able to ascertain the existence of *pyæmia* during life.

There are no remedies for pyæmia. All that we can do is to sustain the system. We may give tonics and stimulants and nourishing food. Beyond that we cannot go.

QUASSIA.

The wood, bark, and root of the quassia tree are all exceedingly bitter, but possess no aromatic principle. The wood, which is the part chiefly used for medicinal purposes, is a cheap, simple, and valuable tonic, especially in some forms of indigestion, in looseness of the bowels (diarrhœa), in ague, and remittent fevers of warm climates.

The *infusion of quassia* is prepared in the following manner: "Take of quassia, sliced, two scruples; boiling water, a pint; macerate for two hours in a vessel lightly covered, and strain. The dose is a wine-glassful three times a day."

QUININE. (See *Peruvian Bark.*)

QUINSY.—SORE THROAT.

Quinsy, or inflammation of the throat, is seldom ushered in by shivering, as in other inflammatory diseases; it usually commences with a slight degree of headache, and stiffness of the neck, and a feeling of general uneasiness. At the same time or shortly after a slight difficulty in swallowing is experienced, together with a sensation of heat and dryness or rawness of the throat, which is soon followed by pain more or less severe, according to the intensity of the inflammation. The patient has a constant inclination to swallow, and every attempt at deglutition greatly increases the pain; the voice becomes nasal, and the articulation imperfect, so as materially to affect the speech; the mucus of the mouth is very tenacious or slimy, and every attempt to spit it out is attended with an aggravation of the pain. Sometimes the patient cannot open his mouth sufficiently to allow the throat to be examined, but if this can be effected, one or both tonsils—generally both, although one is usually more affected than the other—are red and swollen, the uvula or pap of the throat is also enlarged, and hangs down on the base of the tongue. It often happens that the tonsils enlarge until they touch each other; the uvula is then thrown backwards, and almost entirely concealed by them. In many cases the inflammation extends over all the back part of the throat, and is attended by slight deafness, buzzing, and pain. The tonsils are not unfrequently swollen to such an extent that swallowing is entirely prevented, and if the patient attempt to receive any kind of drink it is immediately returned by the nostrils.

If the throat be examined at the commencement of the disease, the tonsils appear like two red balls, dry and shining; but at a later period we may observe in the majority of cases several oval or irregular-shaped spots of a yellowish, sometimes of a greenish color, not only upon the surface of the tonsils, but on all the parts to which the inflammation has extended. We must be careful not to mistake this appearance, which arises simply from thick tenacious mucus deposited upon the inflamed surface, for that which results from a much more dangerous form of the disease—the malignant or putrid sore-throat, in which false membranes are thrown out similar to those which we have described as being formed upon the lining membrane of the windpipe in croup.

The feverish symptoms which accompany quinsy are generally more severe than the local disorder would lead us to expect; the pulse is full and frequent, sometimes as high as 120 in the minute; the face is flushed; there is headache, with a sensation of fulness and weight in the head; there is considerable heat of skin, which sometimes alternates with slight shivering; the tongue appears swollen, and is covered with white or yellowish-colored mucus, and there is a disagreeable taste in the mouth; sometimes there is nausea or vomiting; the bowels are generally constipated; the urine is scanty and high-colored; the patient is restless during the night, and complains of a feeling of fatigue and general oppression.

Causes.—Exposure to vicissitudes of temperature, sitting in a current of air, wet feet, wearing damp linen, going out of a heated room into the cold air, or cold and wet, in whatever manner applied, are the most frequent causes of quinsy. This disorder occurs generally in young people, and is common in all cold and variable climates, more especially in spring and autumn. Women are more particularly subject to it during the period of menstruation. The tendency seems to run in some families. Some who are subject to it in early life in time outgrow it.

TREATMENT OF QUINSY.

1. Take a dose of the cold powder (see *Cold Powder*) before retiring, at the same time soaking the feet in hot water and mustard.

2. Use gargles of chlorate of potash—twenty or thirty grains to an ounce of water—and take chlorate of potash internally, in doses of ten grains.

3. If this treatment does not break up the attack, apply flaxseed poultices to the sides of the neck.

4. Inhalations of the steam of water or of medicated solutions may afford relief in severe cases. (See *Inhalations.*)

Chronic enlargement of the tonsils. This is a very common affection. The treatment is—

1. To give iodide of iron or Lugol's solution internally.

2. To apply Lugol's solution and glycerine, equal parts, to the tonsils.

3. To sustain and strengthen the health of the patient by good food, outdoor air, etc. Very rarely is it necessary to cut out the tonsils.

In the *relaxed sore throat*, or that state of chronic enlargement of the tonsils and uvula to which many people are subject in the spring and winter seasons, in all countries where the weather is cold and variable, the remedies usually employed are astringent gargles, such as a strong decoction of oak bark, or the following:

Purified alum, one drachm,
Tincture of myrrh, half an ounce,
Water, seven ounces. Mix.

Ten grains of *nitrate of silver* (*lunar caustic*), dissolved in one ounce of water, constitute an excellent application for this description of sore throat: it should be applied by means of a camel's-hair pencil. Many people derive benefit from the use of *Cayenne lozenges;* but it often happens that the throat continues in this relaxed state for months, obstinately resisting every kind of local treatment. Under such circumstances, change of air, active exercise, and temperate habits will be found the best remedies.

REMITTENT FEVER.

Some indisposition usually precedes an attack of remittent fever for several days. The patient is listless, languid, complains of headache, pains in the back and loins, and oppression at the chest. The appetite is impaired, and the bowels are irregular.

The attack in general commences with shivering, or a sensation of cold and chilliness, alternating sometimes with flushes of heat. This state is soon succeeded by burning heat and dryness of the skin, flushing of the countenance, and injected eyes, with great increase of the headache, and pains of the back and limbs. The tongue is foul, and the mouth sometimes dry and clammy; there is nausea, and perhaps vomiting, with much thirst. The pulse, which during the cold stage was weak and quick, is now full and strong; the breathing may be hurried, and the patient is extremely restless. The throbbing and pain of the head are occasionally very violent, and may end in delirium; the urine is scanty and high-colored; the bowels are generally, though not always, constipated; and some degree of tenderness is felt on pressing with the hand over the stomach.

After these symptoms have continued from twelve to eighteen hours, partial perspirations appear, followed by an abatement of the febrile symptoms; or they subside without any moisture on the skin. The remission is marked by the pulse being less full and frequent, the skin cooler, and the pains in the head, back, and loins relieved; and by the patient being free from delirium, and the stomach in a less irritable condition. Nine or ten hours elapse before the patient is seized with another paroxysm, which may come on at once without any feeling of cold, or be preceded as at first by chilliness or shivering. The disease goes on in this manner with alternate remissions and returns of fever. If the case end favorably, each succeeding paroxysm becomes milder, until the fever entirely disappears, or it may be carried off by copious perspirations. The periods of remission and increased severity are very irregular, though the abatement of fever very generally takes place in the morning. In cold climates the disease may run on to the fourteenth day, or later; but in hot countries it is much more rapid in its course, terminating sometimes as early as the third day; but the usual period is from five to seven or nine days.

In the more violent and dangerous cases the skin is burning hot and the thirst intense; the vomiting is incessant, scarcely anything being retained on the stomach; there is violent throbbing or shooting pain of the head, attended sometimes with furious delirium; and the pulse is full, quick, and strong. The remissions are short and indistinct, and if the fever proceed to a fatal termination it may become continued. The tongue is furred, red, contracted, and dry, or crusted with black matter; the skin and eyes may have a yellowish tinge; and dark-colored matter may be discharged from the stomach. In some cases before death there are copious perspirations, and the patient sinks rapidly; or the hot, pungent, dry skin continues to the last.

Fever of the remittent type has been divided into different varieties from some peculiarity of the symptoms, or from particular organs being affected. Thus, for example, when the liver is diseased, or there is much disorder of the biliary organs, it has received the name of *bilious remittent;* when the eyes become yellow, and the skin acquires a dusky yellowish hue; there is vomiting or purging of bilious matter; the tongue is loaded with a yellow fur; and there is often tenderness on pressing with the hand under the ribs, at the right side, in the situation of the liver. The irritability of the stomach in this form is generally very obstinate, and the determination of blood to the head great.

TREATMENT OF REMITTENT FEVER.

1. *Open the bowels by a dose of Epsom salts.*

2. *Quench thirst with lemonade and effervescing draughts. If the head is hot, apply ice, and bathe the feet in hot water.*

As soon as a remission takes place, which may be known by an abatement of all the symptoms, as already pointed out, the *sulphate of quinine* should be administered; and in hot climates, although the remission be short, and not very well marked, still the opportunity should not be lost of giving this excellent medicine. Two grains may be taken at first in a little water, or wine and water, every hour and a half or two hours; or,

Sulphate of quinine, a drachm,
Elixir of vitriol (aromatic sulphuric acid), two drachms,
Water, a quart. Mix. A wine-glassful to be taken every two hours.

If the bowels have not been well evacuated an ounce of Epsom salts should be added to this mixture, but purgative medicine ought always to precede the exhibition of quinine. It ought always to be borne in mind that in administering this medicine the same dose will not answer for each individual; some persons can scarcely bear the smallest quantity, while others require it to be given in large doses to produce any decided effect; hence the safest method of employing it is to commence with a small dose, increasing the quantity gradually until some of its usual effects on the system are felt—as giddiness, ringing in the ears, slight deafness, nervous restlessness, &c.; the medicine ought then to be left off for a time. The quantity which the system will tolerate can be thus ascertained, and the doses regulated accordingly. The exhibition of quinine must, of course, be suspended on the recurrence of febrile symptoms, and again resumed during the period of remission. For several days after the fever has entirely disappeared it ought to be continued in gradually diminished doses. If left off too soon a return of fever is a very probable consequence.

In the malignant form, where there is great depression from the beginning, with weak, quick pulse, stimulants must be given early. In hot climates sudden sinking of the vital powers sometimes occurs; the pulse becomes weak and irregular, or is scarcely to be felt; the extremities are cold and clammy, and the body may be covered with cold perspiration; the face is pallid; the eyes sunk in their sockets; and the voice fails. When these symptoms are present no time is to be lost in giving stimulants. Port or Madeira wine, or brandy, in sago, arrow-root, &c., or champagne, which is the best stimulant in such cases, should be given every hour until the pulse begins to rise and the extremities are warm; stimulants are then to be discontinued. The cold perspirations must be constantly wiped off, and the extremities rubbed with warm flannels or rough towels. To rouse the system, mustard poultices or blisters are to be applied over the stomach or to the calves of the legs. If the tongue be charged with a yellowish or brownish-colored fur, and the bowels have not been well cleared out, the following pills should be given every third hour till discharges follow:

Calomel, four grains,
Quinine, two grains,
Camphor, two grains. Mix, and form into two pills for one dose.

But if the bowels have been well evacuated, a quarter of a grain of opium may be added to the above prescription, and the dose of calomel reduced to two grains, discontinuing it altogether if the gums become sore. The opium ought also to be omitted if much drowsiness arise; but in these states it usually acts as a stimulant when given in small doses.

In the course of the attack the patient may be put in a warm bath when there is much restlessness and hot, dry skin; or at the commencement, if the extremities be cold, the pulse weak, and reaction have taken place but imperfectly, a hot bath will be of great utility. The patient's drink should consist of barley-water, lemonade, soda-water, tamarind beverage, &c.; and if requested by the patient, cold water may be allowed, a copious draught of which we have known to bring on perspiration when other means had failed. Liquids should never be taken in large quantities if irritability of stomach be present, as they will be rejected almost immediately. In the low malignant varieties, effervescing liquors, such as Seltzer or soda water, light beer, &c., will be useful, and are likely to remain on the stomach. The diet ought to be light and nourishing—as arrow-root, sago, panada, &c., and if the strength be much reduced, beef-tea, soups, custards, &c., should be allowed. Sometimes the vomiting is so intractable that no nourishment will remain on the stomach; in that case the patient's strength may be supported by injections of arrow-root, broths, or other nourishing fluids in small quantities. The apartment ought to be kept perfectly quiet; the evacuations are to be immediately removed, and the room sprinkled with *vinegar* or *chloride of lime*, if the effluvia be disagreeable.

In some cases it may be necessary to give arsenic instead of quinine.

The period of convalescence is sometimes very tedious, tonic and strengthening medicines being necessary; but change of air will be found one of the best of remedies; this is particularly beneficial when the fever has ended in the intermittent form (ague), which in many cases will not yield to the usual remedies until the patient resort to change of situation.

RHEUMATISM.

The more immediate or exciting cause of rheumatism is cold, especially when it succeeds an opposite state of the atmosphere, or is combined with moisture; and the system is more particularly susceptible of the injurious influence of cold when the person is fatigued, or in a heated and perspiring state. But although undue exposure to cold in some way or other will be found to have preceded an attack of rheumatism in by far the greater number of cases, it does not appear that this alone is sufficient to give rise to the disease, inasmuch as the instances where individuals are attacked in consequence of exposure to cold are small indeed compared to the numbers who are constantly exposed to atmospheric vicissitudes, and to the influence of cold under all the circumstances in which it would be most likely to prove injurious, without any disease being induced. Hence it may be inferred that cold cannot produce rheumatism, unless the system be predisposed to it; but of the real nature of this predisposition we have no positive knowledge.

Rheumatism appears under two forms—the *acute* and the *chronic*.

ACUTE RHEUMATISM, OR RHEUMATIC FEVER,

Is often preceded during several days by general uneasiness, giddiness, ringing in the ears, a feeling of weight and fulness in the head, sometimes headache; there may be also occasional palpitations, hurried breathing on any slight exertion, and symptoms of congestion or fulness of blood in different organs. But these premonitory symptoms are not always observed; it frequently happens that the disease comes on suddenly, in consequence of the body having been exposed to cold and wet. In either case certain general symptoms usually precede the local inflammation. These consist in more or less severe shivering, alternating with flushes of heat, followed by quickness and fulness of the pulse, hot skin, thirst, and a sensation of fatigue in the back and extremities. After several hours, sometimes not before the expiration of a day or two, an aching or gnawing pain is felt in one or more of the larger joints, which goes on increasing until it becomes exceedingly severe, often lancinating as in gout, and greatly aggravated by the slightest movement or pressure. The affected joints become swollen, and the skin covering them acquires a rosy tint, which generally appears in patches. The fever gains ground with the increased severity of the local symptoms; the pulse becomes full and bounding, varying from a hundred to a hundred and twenty beats in a minute; the face is flushed or pale, and bedewed with perspiration; the eyes are red; the skin is hot, and occasionally covered with perspiration which emits an acid, pungent smell; the urine is scanty, and deposits a brick-colored sediment; the tongue is white and furred, but continues moist; there is considerable thirst, and the appetite is lost. When many of the joints are affected at the same time, the patient lies on his back, and is incapable of moving, his limbs being completely disabled; the slightest movement of the body is attended with excruciating pain; the suffering is greatly increased during the night, and if sleep overtake him towards morning, he is soon roused by some frightful dream. Sometimes the fever almost entirely subsides in the morning; this, however, is attended with little or no mitigation of the pain; and it is equally remarkable that no relief is afforded by the profuse sweating which frequently occurs during the progress of the disorder. The migratory character of rheumatic inflammation is another singular feature of the disease; it often shifts its seat from one joint to another, and after some time perhaps returns to the joint originally attacked.

Rheumatism, though a painful and severe disease, is seldom dangerous unless it extend to the heart, and then the risk is greatly increased. Even in this case the immediate danger generally ceases along with the fever; but in many instances disease of the valves of the heart is subsequently induced, and gives rise to enlargement of its substance (hypertrophy), and dilatation of its cavities,—lesions which sooner or later terminate in dropsy and death.

The febrile symptoms usually abate about the end of the second week; the local symptoms then gradually diminish until they entirely disappear, or the disease passes into the chronic form.

CHRONIC RHEUMATISM.

The symptoms being less severe and of longer duration, are the principal circumstances which distinguish chronic from acute rheumatism. The general character of both these forms of the disease is the same, and the former is in many cases merely the sequel of the latter. In the chronic form the joints are more or less swollen and painful, while symptoms of general excitement are always present in a sufficiently marked degree to indicate the existence of inflammation. The tongue is white and furred, the skin is hotter, and the pulse quicker than natural; the latter, it is true, sometimes appears feeble and easily compressed, but is always in some degree increased in quickness; and if blood be drawn from the arm, it will invariably present the buff-colored appearance on its surface which is observed in all inflammatory diseases. Both the constitutional and local symptoms may continue, varying at times in severity according to circumstances, during a longer or shorter period, perhaps several years; and the disease, if not checked by proper treatment, gradually undermines the patient's health, while it disorganizes the joints, wastes the muscles, and renders him a cripple.

Chronic rheumatism, after continuing a considerable length of time, may ultimately wear itself out; that is to say, the febrile symptoms may cease, and the local disease may no longer carry on its ravages in the joints. The parts which have been inflamed may remain cold, stiff, and contracted; and exposure to cold or atmospheric vicissitudes may render them painful, but rheumatism, properly speaking, no longer exists; the patient now only labors under the morbid changes which the disease has already induced. This state requires little or no medical treatment, and ought therefore to be carefully distinguished from that above described, in which the judicious use of suitable remedies may be of the greatest service.

In the above brief description of rheumatism, we have mentioned that the disease sometimes extends to the heart. This accident occurs most frequently when the disorder has been neglected at the commencement, or when inappropriate remedies have been employed. The symptoms by which we judge that inflammation has invaded this vital organ are, unusually hurried breathing, pain in the region of the heart, perhaps palpitation, and a feeling of oppression at the chest.

Physicians ascertain that rheumatism has gone to the heart by auscultation. (See *Auscultation.*)

TREATMENT OF ACUTE RHEUMATISM.

Acute rheumatism is now chiefly treated by *alkalies*. This method of treatment was introduced by Dr. Fuller, of England. *Alkalies* are given on the theory that rheumatism is caused by acids in the blood.

The alkalies that are usually given for rheumatism are the *carbonate or bicarbonate of potash, Rochelle salts, and saltpetre.*

These remedies may be given in doses of from twenty to forty grains, or about half a teaspoonful in water three or four times a day.

These alkaline remedies, though by no means certain or infallible, are yet more surely efficacious than any other mode of treatment for acute rheumatism with which the profession is familiar.

A certain distinguished physician once made the statement that when "he began practice he had twenty remedies for rheumatism, but in his old age he had not one."

The truth is, that what will cure acute rheumatism in one may only aggravate the disease in another.

If the alkalies do not cure the patient, directly opposite treatment may be used, and *lemon juice* may be given in doses of a tablespoonful every two or three hours, and large quantities of lemonade may be drank.

Quinine acts well in many cases.

The *Cold Powder* may be given at night to relieve pain and induce sleep. (See *Cold Powder.*)

Colchicum sometimes assists us when all these other remedies fail.

The swollen limbs may be bathed in laudanum and alkaline solutions, and also wrapped in flannel or oiled silk. No powerful applications should be made to the inflamed parts, lest the disease may be driven to the heart.

It is always well to try the alkaline treatment *first.* Especially on account of the tendency of acute rheumatism to go to the heart, patients should in all possible cases place themselves under the care of a physician.

TREATMENT OF CHRONIC RHEUMATISM.

One of the best remedies for the nameless phases of chronic rheumatism that are so common everywhere, is *general electrization.* (See *Electrization* and *General Electrization.*) There are, however, many severe long-standing cases of chronic rheumatism that nothing will ever cure or even relieve. There are cases which all known methods of treatment, including general electrization, seem only to aggravate.

Such patients are justified, I think, in trying the various "waters" and "baths" and "climates" that their means allow them to avail themselves of. Anything is preferable to hopeless despair. *It must be confessed that our treatment for the severe obstinate forms of chronic rheumatism is very unsatisfactory.*

The best internal remedies are *iodide of potassium*, *guaiac*, *quinine*, and *cold castor-oil*. All of them may be tried in succession.

Russian and Turkish baths often afford relief. (See *Russian and Turkish Baths.*)

Sunlight is a good remedy, and *sunlight baths* are to be recommended.

But all of these remedies too often fail us.

LUMBAGO is simply another name for rheumatism in the back. It may be much relieved by *dry cupping* (see *Dry Cupping*), and by the application of *spongio-piline* (see *Spongio-piline*), or by the use of *oiled silk* or *rubber cloth.*

The thousand and one liniments that are used for rheumatism do little harm, and sometimes may afford relief. In obstinate cases they may be tried to an indefinite extent.

Plasters of *belladonna* or *opium*, and the common plasters of the shops, sometimes relieve pain, even though they do nothing toward removing the disease.

SCIATICA is either rheumatism or neuralgia in the sciatic nerve of the leg. It is caused oftentimes by inflammation within the sheath of the nerve. It is most usually classed among the neuralgias. It is sometimes a terribly painful affection, and in exceptional cases appears to be incurable. The majority of attacks are dissipated after a short time, but are apt to recur. Sciatica is best treated by *hypodermic injections of morphine*, and by applications of spongio-piline. (See *Spongio-piline.*) (For details of treatment see *Neuralgia.*)

RHEUMATIC GOUT.

This is apparently a combination of *gout and rheumatism.*

It appears, however, to be a distinct disease from either gout or rheumatism. The joints become swollen, and oftentimes painful. The disease is very apt to attack the fingers and toes. Sometimes the patient becomes terribly crippled, and may indeed be bedridden. The affected joints are usually but little used. The disease is frequently confounded with chronic rheumatism, which it so closely resembles. In the chronic form there is very little if any fever. The patient is usually more or less debilitated. The disease seems to be caused by anything that exhausts or weakens the constitution. Females are attacked by it oftener than males.

The treatment of rheumatic gout consists—

1. In *tonics* of various kinds, such as *cod-liver oil*, *strychnine*, *quinine*, *general electrization*, and so forth.
2. *Lithia* internally, in doses of from three to five grains (it is sometimes given in "*carbonated water*"); and *iodide of lithia ointment*, applied to the affected joints.

The rest of the treatment is the same as for chronic rheumatism.

RHUBARB.

Rhubarb is much employed to give tone to the stomach and bowels, in doses of two or three grains twice or thrice a day; and in doses of from twenty-five to thirty grains it acts as a mild and excellent purgative. Rhubarb, besides its *cathartic property*, possesses a slightly astringent principle; hence after its full purgative action the bowels are liable to become constipated. To obviate this it may be taken with cream of tartar, or a small quantity of jalap or magnesia; and it should be combined with calomel when the liver is in a torpid state. The constipating effect which usually follows the purgative action of rhubarb renders it very serviceable in diarrhœa, in cases where we have reason to suppose that the disorder is caused by offending matter lodged in the bowels. Perhaps the best medicine that can be employed to relieve common colic is an ounce of the compound tincture of rhubarb, with twenty or twenty-five drops of laudanum. The *compound rhubarb pill* of the London Pharmacopœia is a mild and very useful laxative medicine: "Take of rhubarb, powdered, an ounce; aloes, powdered, six drachms; myrrh, powdered, half an ounce; Castile soap, a drachm; oil of caraway, half a drachm; syrup, as much as may be sufficient. Mix the powders together, then beat the whole together until incorporated." The usual dose is two pills of five grains each.

RICKETS.

Rickets occurs generally in children between the ninth month and the fourth year of their age, and is essentially characterized by softening of the bones. At the commencement of the disease the child is observed to be less cheerful than usual, languid, and disinclined to be amused; the appetite is impaired, or capricious; and the bowels are irregular. These symptoms are either accompanied from the commencement, or soon followed, by a slight degree of febrile excitement and disturbed sleep. The process of teething goes on slowly and with difficulty, and the teeth soon decay and fall out. The bones of the skull, instead of gradually closing and becoming united, separate from each other, and the head increases in size; the belly is also enlarged; while the limbs, more especially the thighs and legs, appear thin and wasted. After a longer or shorter period the symptoms which more particularly characterize the disease are manifested. The ends of the long bones at the wrists and ankles, and the extremities of the ribs where they join the breast-bone, become swollen and knotted; the spine is curved in the form of the italic letter *S;* the right shoulder rises, the breast-bone is thrust forwards, and appears somewhat like that of a bird. If the child have begun to walk, he is now unwilling to be left on his feet, and cannot cross the room without difficulty; the knees approach each other, the feet are turned outwards, the limbs are unsteady, and seem to yield under the weight of the body. As the disease advances the digestive organs suffer, and the urine deposits a white sediment; the bones now begin to lose the phosphate of lime which gives them firmness, and are softened in such a manner that they bend in all directions, and the little patient is soon reduced to a shocking state of deformity, which renders him a singular, though distressing, object of observation.

Rickets does not generally prove fatal unless the disease declare itself shortly after birth, and then it almost invariably destroys life. When it appears at a later period, and proper attention is paid to the patient the general health improves, and recovery frequently takes place, but not without leaving a raised shoulder, a hump-back, or some other deformity. In females, the bones of the pelvis often remain distorted, and this, in the event of pregnancy, necessarily leads to consequences of a more or less dangerous nature. If the disease do not give way before the patient reach his fifth or sixth year, he is doomed to be a miserable object during life, which is seldom prolonged to middle age.

Causes.—In the higher classes of life this disease is comparatively rare, and when it does appear, can generally be traced to hereditary transmission; but among the children of the working classes it is far from being uncommon, and appears to originate from the same debilitating causes which give rise to scrofula. Mothers of weak constitution and relaxed habit of body, who live on poor diet, and neglect or have it not in their power to take sufficient exercise in the open air, or are exposed to the long-continued influence of any of the various debilitating causes which impair the vital energies, cannot be expected to bring forth robust and healthy infants; neither is it possible that they can nurse them properly after they have given them birth.

Treatment.—Children who have every attention paid to them are sometimes attacked by rickets, but in the great majority of cases much may be done to prevent the disease coming on. If the child be delicate from its birth; if any individuals of the same family be rickety; if the parents be scrofulous; or if there be any other circumstances which might lead us to dread the occurrence of the disease, it will be advisable to procure a strong healthy nurse for the infant, in whom confidence can be placed, and her diet should be carefully attended to as long as the child continues at the breast, in order that her milk may be plentiful and nutritious. Chicken or mutton broth, beef-tea, &c., may be allowed at an earlier period than would be proper for robust healthy children. The child should be washed daily, and the limbs frequently rubbed with a warm hand; and, when the weather permits, he should be carried out into the open air as much as possible, and kept clean and dry.

SUMMING UP OF THE TREATMENT.

1. *Air and sunlight.* (See *Hygiene.*)

2. *Nourishing food.*—Beef-tea, beef, mutton, eggs, fish. These should be taken freely, according to the age of the patient and the appetite. Nothing brings on rickets like starvation.

3. *Tonic medicines.*—One of the best remedies for rickets is "chemical food," or the syrup of the *hypophosphites of lime and soda.* (See *Syrup of Hypophosphites.*)

The elixirs of iron, strychnine, and quinine may also be given.

RINGWORM, OR SCALD-HEAD.

Ringworm, or scald-head, is a common and well-known disorder of the hairy scalp, occurring chiefly in children. It is manifested under various forms, which have been minutely described by writers on cutaneous diseases; but such distinctions, although they may be interesting to medical men, are, in a practical point of view, of no value, inasmuch as the essential characters of the disease are always the same, and the different appearances which it assumes are, no doubt, owing to some local or constitutional peculiarity.

Ringworm usually appears in patches of an oval or circular form, each of which consists of numerous pustules of a pale yellow color, and often so minute as not to be seen with the naked eye. These soon burst, and the thin acrid matter which they discharge forms crusts or scabs. In the course of a few days a fresh crop of pustules break out round the patch; these burst in their turn, and the exudation increases the size of the scabs, which, if not removed by proper attention to cleanliness, become thicker, firmer in consistence, and run into each other; in this manner the disease, if not arrested in its progress, extends over the whole head, and sometimes attacks the forehead and neck. The hair appears to be affected from the commencement of the disease, and gradually falls off; the baldness thus produced constitutes one of the leading features of the disorder.

Ringworm is decidedly contagious; it is often caught at schools by boys putting on each other's caps, using the same towels or combs, or sleeping in the same bed. "To show you," says Dr. Elliotson, "how very contagious this disease is, I may mention that a barber had a child with a scald-head, and he kept a razor specially for shaving it. One day by mistake he shaved himself with it, and although he had washed and stropped the razor well, and had put it into hot water first, yet the disease came out upon his chin about a week afterwards. I saw it distinctly. Small circular pustules came out. You must strongly impress upon the minds of people the necessity of a child's dress being kept by itself in this affection, lest the disease should spread." When it breaks out in large schools or manufactories, it is often exceedingly difficult to eradicate.

Treatment.—The first thing to be done is to shave the head; but if the disease has advanced so far as to render this impracticable, the hair is to be cut as short as possible. In the latter case it is always advisable to wash the head repeatedly with soap and warm water, and apply warm poultices of bread or linseed meal, to remove the scabs. When we have succeeded in this the parts of the scalp affected should be well anointed night and morning with the following ointment, and after each rubbing the head is to be covered with brown paper.

Common soda (barilla, or natron), three drachms,
Sulphuret of potash (liver of sulphur), the same quantity,
Lard, three ounces. Mix.

The head must be well washed with soap and water, and carefully dried with soft rags, before the application of the ointment. This is the best application for scald-head with which we are acquainted, and when assiduously used generally effects a cure in the course of three weeks. The ointment may be made stronger if not found sufficiently active.

Creosote ointment is at present much employed in mild cases, and frequently with success; it should be applied at bedtime, and the precaution above-mentioned, to wash the head previously, should not be neglected.

Sometimes the patches are considerably inflamed at the commencement of the disease; in this case it will be necessary, before using the ointment, to wash the head frequently with tepid water or a *decoction of poppy heads*, and apply emollient poultices until the irritation is removed.

In every case the local treatment will be greatly aided by attention to diet and regimen; the food should be light, yet sufficiently, nutritious; the feet must be kept warm; the tepid or cold bath, or sponging the body, should not be neglected; and in a word, every means ought to be adopted to support the general health.

There is a species of this disorder occasionally met with, called *bald-scall*, which is characterized by oval or circular patches of baldness on different parts of the scalp. The denuded spots present a smooth, shining, silvery appearance, without any kind of eruption.

The treatment of this form of the disorder consists in shaving round the bald places to the extent of an inch, and rubbing them twice a day with an ointment composed of equal parts of *sulphur*, *tar*, and *lard*. Equal parts of *oil of turpentine* and *spirits of wine* also constitute a very successful application.

The following course of treatment has been recommended for scald-head:

1. Arsenic internally. (See *Fowler's Solution.*)
2. After washing the parts with a solution of carbonate of potassa (one drachm to a pint of water), apply an ointment of this prescription:

Carbonate of potassa, one drachm,
Glycerine, two drachms,
Lard, one ounce.

This ointment may be applied every day, or even more frequently. (See *Skin, Diseases of.*)

Many of these diseases of the skin are quite difficult to manage; and in all important cases, or severe affections, like scald-head, medical advice should be obtained.

ROCHELLE SALT.

Rochelle salt acts as a cooling, mild laxative, and is less disagreeable to the taste than Epsom or Glauber salts. It is the principal ingredient in the well-known Seidlitz powders. The dose is from three drachms to an ounce and a half.

RUBBING. (See *Movement Cure.*)

INFUSION OF ROSES.

The infusion of roses is prepared in the following manner: "Take of red rose petals or leaves, dried, three drachms; diluted sulphuric acid, a drachm and a half; sugar, six drachms; boiling water, a pint. Pour the water upon the rose leaves in a glass vessel; then mix in the acid. Macerate for four hours, and strain the liquor; lastly, add the sugar to it." This infusion is useful in spitting of blood, in the dose of two or three tablespoonfuls three times a day; and is much employed as a gargle for sore throat. It is principally used as a vehicle for the administration of quinine and Epsom salts.

SALT RHEUM. (See *Tetter.*)

ST. VITUS'S DANCE, OR CHOREA.

There is no better description of St. Vitus's dance than that given by Sydenham a hundred and fifty years ago. This disease, he says, is "a species of convulsion, which for the most part attacks boys or girls, from the tenth year to puberty. First it shows itself by a lameness, or rather instability of one of the legs, which the patient drags after him like a fool. Afterwards it appears in the hand of the same side, which he that is affected with the disease can by no means keep in the same posture for one moment; if it be brought to the breast or any other part, it will be distorted to another position or place by a convulsion, let the patient do what he can. If a cup of drink be put into his hand he represents a thousand gestures, like jugglers, before he brings it to his mouth; for whereas he cannot carry it to his mouth in a right line, his hand being drawn hither and thither by the convulsion, he turns it often about for some time, till at length, happily reaching his lips, he flings it suddenly into his mouth, and drinks it greedily, as if designing only to make sport."

It must not, however, be supposed that the above will apply to all the forms under which this morbid affection is manifested. In many cases the involuntary motions are confined to one side of the body; sometimes the face, or only one of the limbs, is affected; the muscles of the windpipe and tongue are occasionally attacked, and then the patient cannot articulate properly. In some instances deglutition is performed with difficulty. The disease assumes a variety of appearances, according to the severity of the muscular disorder, and the number of parts affected. It is very liable to relapse, and has been known to recur several times in the same person. It is not dangerous, and in young persons generally terminates favorably. It may continue only a few weeks, or as many months; in some cases it has been known to continue through life, without having materially injured the general health.

St. Vitus's dance is essentially a *nervous disease.*

TREATMENT OF ST. VITUS'S DANCE.

There is no specific for *chorea.* All tonic remedies are of value, and may be used.

The tonic remedy on which I chiefly rely for the treatment of this disease is *general electrization.*

Gymnastic exercises are also of service. Internal remedies are those to which the people most naturally resort in this as in all similar affections. *Valerianate of zinc* has been used successfully for chorea. So also has *sulphate of zinc*, in doses of one grain three times a day. *Bromide of potassium*, cod-liver oil, pyrophosphate of iron, strychnine, etc., all succeed and all fail. There is no uniformity in the results.

It should be remembered that many cases recover by time without any medical treatment. On the other hand, there are obstinate cases that will yield to no treatment or combination of treatment.

Partial chorea, limited to one arm, or to the muscles around the eye, nose, or corners of the mouth, I have found more obstinate usually than general chorea of the whole body.

Parents should remember that it may attack a child through *sympathy.* Sometimes it may attack quite a number in succession in the same school.

St. Vitus's dance is sometimes complicated with some disease of the heart. This fact, when suspected, can be ascertained only by the ear of the physician.

There is no necessity for purging in this disease, but care should be taken to keep the bowels gently open, with mild laxative medicines. The cold bath ought never to be neglected. The above treatment will be greatly aided by attention to diet and regimen; the food should be light and nourishing, and exercise should be taken in fresh and open air. Sea-bathing is of great service.

It is a singular and interesting fact in the history of chorea, that it has been found to recover under nearly every form of remedy that has been tried. The consequence is that a large number of *specifics* have been claimed for this disease, which in time have disappointed those who relied on them. There are so many cases which recover of themselves that it is frequently difficult to describe just how much good has resulted from any treatment that we have adopted. On the other hand, there are some cases that resist every form of medication, and persistently annoy the patient for years.

SAL-AMMONIAC (MURIATE OF AMMONIA).

This remedy is much used for inflammation of the air-passages. In inflammation of the mucous membranes generally, it is quite beneficial. Internally it is employed for *gout*, *rheumatism*, and *neuralgia*.

For the throat it can be employed in the form of a gargle, or as an inhalation. (See *Inhalations.*) The fumes of sal-ammoniac are used by aurists in the treatment of inflammation of the middle ear.

The dose of the powder is from five to twenty-five grains.

SANTONINE.

This remedy is used to destroy worms. In some cases it is very successful.

The dose of santonine is from *two to five grains.*

SARSAPARILLA.

In the broken-down state of the constitution which has arisen from long-protracted syphilis, or from mercurial irritation, the compound decoction of sarsaparilla, prepared in the following manner, is generally considered an excellent restorative,—at least, it is very extensively employed: Take of sarsaparilla, sliced, five ounces; boiling water, four pints; macerate for four hours in a vessel lightly covered, near the fire, then take out and bruise the sarsaparilla. When bruised, return it to the liquor, and again macerate in the same manner for two hours; afterwards boil down to nearly two pints; then add sassafras, sliced, guaiacum wood shavings, and liquorice bruised, of each five drachms; mezereon, a drachm and a half; boil the whole for a quarter of an hour, and strain. A pint of this decoction must be taken in the course of the day. The powdered root may be taken to the extent of an ounce, in divided doses during the day. In whatever manner sarsaparilla is taken, it must be continued regularly during several weeks.

SCAMMONY.

Scammony, in the dose of from five to fifteen grains, acts as a strong purgative; it is frequently given with cream of tartar, in dropsy; and in combination with calomel and jalap to destroy worms, and to carry off slime from the bowels of children. It enters into the composition of many of the purgative pills in general use.

SCARLATINA, OR SCARLET FEVER.

The first, or mildest form of scarlatina, commences with loss of appetite, sometimes slight nausea, but rarely vomiting; a dull heavy pain in the loins and lower extremities, and occasional chills or shiverings, which are soon followed by fever. The surface of the body becomes hot, although the feet are sometimes cold. The pulse varies from 106 to 120; in some cases it reaches 140, and the thirst is urgent. On the following day, sometimes later, the rash appears upon the skin, but its commencement is not so regular as that of other eruptive diseases; sometimes it breaks out first on the face, or on the neck, and upper part of the chest; at other times, on the trunk or on the limbs, and spreads, in the course of twenty-four or thirty hours, over the whole surface of the body and extremities. It consists of innumerable small red points so closely set together that the skin acquires a uniform red color, which has been compared to that of the shell of a boiled lobster, and feels rough to the touch, more particularly at the parts where it is brightest. The rash extends to the inside of the nostrils and mouth, to the tonsils or almonds of the ears, and over all the back part of the throat. The tongue is also covered with the rash, but it generally happens that its edges and point only present a bright red appearance, the surface being coated with white mucus. The eruption, in many instances, is not diffused over all the trunk of the body, but is distributed in large irregularly shaped patches. The parts on which the body rests are of a bright raspberry-red tint; the color is also deeper at the folds of the joints, and is more vivid in the evening than in the morning. The skin is always intensely hot, and affected with troublesome itching. Sometimes there is considerable swelling of the face, of the throat, and of the extremities of the body, and occasionally a slight degree of delirium. The burning heat of the skin, the thirst, sickness at stomach, constipation of the bowels, and difficulty in swallowing become less severe in some instances when the rash breaks out, but more frequently they continue until it begins to disappear.

The eruption loses its brightness and gradually diminishes towards the fifth day, and generally disappears on the seventh; the patient can now swallow with ease, and the fever has ceased. It frequently happens that perspiration or purging takes place at this time, or the urine deposits a quantity of sediment. On the seventh day, the cuticle or scarf-skin begins to scale off, and this process is completed on the tenth day. In some instances, the falling-off of the skin is scarcely perceptible; in other cases, again, it continues to separate and peel off during two or three weeks; and as long as the scaling of the skin goes on, the patient is annoyed with a troublesome itching.

The second form of scarlatina, with severe sore throat, commences with stiffness of the neck and lower jaw, and the throat is affected before the feverish symptoms are manifested; these are much more urgent than in the simple form of the disease above described, and precede the rash during two or three days. The edges of the tongue are red, and numerous red points are seen rising through the crust with which it is covered; the uvula or pap, tonsils, and all the back part of the throat are intensely red, painful, and so much swollen that swallowing is rendered distressing and difficult, sometimes impossible; and then, when the patient attempts to quench the burning thirst which constantly distresses him, the drink passes off through the nostrils. The breathing is more or less embarrassed, the voice is hoarse, and there is a very distressing sensation of constriction in the throat. The pulse is very quick, the skin hot, there is sickness at stomach and sometimes vomiting, great restlessness, headache, often delirium towards evening, and not unfrequently bleeding from the nose. The rash does not cover the whole body, but appears in broad, irregular patches; these often vanish, and again make their appearance on different parts of the body at uncertain times. The red color of the skin is more particularly observed on the buttocks, about the loins, in the arm-pits and hams, and at the bend of the arms.

But the predominant symptom of this form of the disease is sore throat. In most cases the tonsils and back part of the throat and mouth are covered with specks or patches of adhesive matter (coagulable lymph) of a grayish-white or ash color, which at first sight might be mistaken for ulceration. These little masses or patches of lymph sometimes acquire a dark-brown or black color, from being mixed with blood. When the throat presents this black appearance, the tongue and lips are often at the same time covered with dark-colored crusts. A very tenacious, tough phlegm also collects in the throat, and by inducing the patient to make frequent efforts to get rid of it, greatly aggravates his sufferings. The throat may become slightly ulcerated, but this does not generally occur.

On the fifth or sixth day of the disease, sometimes later, the inflammation of the throat and the febrile symptoms begin to subside, while the rash grows less vivid, and gradually disappears. If the rash has been slight, the scarf-skin does not scale off, but in ordinary cases it is detached, as in simple scarlatina, and the scaly peeling of the skin often continues during two or three weeks, or even longer; in the more severe cases, the skin peels off the hands in large masses resembling portions of a glove.

The third, or malignant form of scarlatina, commences like the one last described, but the eruption appears at an earlier period, usually within twenty-four hours, advances slowly, and is seldom of a bright red color. It often recedes suddenly, and reappears; and after some time the rose color which it first assumed changes to a livid-red hue. The pulse is very quick, varying in fatal cases from 120 to 140 even to the last moment; the eyes are bloodshot and watery, there is great heat of skin, with vomiting and oppression of the system. On the third day, or at an earlier or later period, low delirium comes on, and the pulse loses strength, although it still continues exceedingly quick; the tongue is covered with a dark-colored crust, and, in a word, the worst symptoms of typhus fever are present. The throat presents the same dark-brown or ash-colored appearance already described, and the breath is very offensive; but mortification or sloughing of the throat is not a frequent occurrence, even in fatal cases. The soft, pulpy gangrenous appearance of the tonsils and fauces arises from the exudations with which the mucous or lining membrane of these parts is covered becoming putrid from exposure to heat and moisture.

As the disease advances, the prostration of the vital powers increases, numerous purple-colored fever spots make their appearance, and a disagreeable odor exhales from the skin. When young children are affected with this form of the disease they lie in a state of stupor, and the pulse is so quick that it can scarcely be counted.

In malignant scarlatina the system appears to be saturated with a peculiar poison, which constitutes, as it were, the essence of the disease, and while nature is struggling to expel this morbific matter the patient dies. This termination often occurs on the fourth or fifth day, sometimes on the third, and in many instances death does not take place till the second or third week. Some patients recover even when the urgency of the symptoms appeared to preclude all hopes of recovery, but in such cases the convalescence is always exceedingly tedious.

Various affections occasionally follow scarlatina, as swelling of the glands under the angles of the lower jaw, abscesses of the tonsils, inflammation of the ear, leaving a discharge of fetid matter, sometimes deafness; but the disorder most to be dreaded is dropsy, which not unfrequently attacks the patient during the second or third week after the disappearance of the rash. Dropsy occurs oftener, and is for the most part more dangerous in children than in adults, and is more frequently observed in winter than in summer. Before this affection makes its appearance the patient generally complains of depression of spirits, loss of appetite and disturbed sleep; these symptoms are soon followed by quick, hard pulse, hot skin, constipation of the bowels, scanty urine, and much restlessness. The dropsical swelling is first observed in the eyelids; it then attacks the face, the limbs; and soon extends, in many cases, to the whole body. When dropsy is confined to the external parts of the body, there is comparatively little danger; but when in the belly, or in any of the internal cavities, the disease is then to be viewed in a more serious light.

Scarlet fever may sometimes be confounded with measles. The differences between them are these: In scarlet fever the eruption comes out on the second day, with sore throat, but no catarrh of the nose. Measles comes out on the third day, with catarrh of the nose. The eruption of scarlet fever is of a brighter-red color than that of measles, and is more evenly diffused.

Scarlet fever is contagious, but it acts very capriciously. A great many who are exposed do not take the disease. Sometimes it runs through a family of children. It usually goes harder with adults than with children. Very rarely it attacks the same person twice.

TREATMENT OF SCARLET FEVER.

The majority of mild cases recover without any special medical treatment.

The bowels are to be kept freely open by Epsom salts. *Sweet spirits of nitre* may be given in the ordinary doses.

The patient may drink cold water or suck ice to almost any extent.

The inflamed throat may be treated by a gargle of *vinegar and water*, to which a little capsicum or cayenne pepper has been added.

The surface of the body may be freely sponged with cool or tepid water.

Under this plan of treatment mild cases of scarlet fever will recover.

Malignant forms and cases attended with debility will need in addition *nourishing food*, such as *beef-tea*, chicken broth, &c.; *tonics*, such as quinine, phosphoric acid (see *Phosphoric Acid*), &c.; and in some cases *stimulants*, in the form of brandy, whiskey, or wine.

Sulphite of soda is now considerably used in malignant scarlet fever. It is supposed to be an antidote for the poison.

Solutions of *chlorate of potash* (one drachm to a pint of water) may be applied to the throat, and may also be taken internally. It is very important the throat should be well treated, so that *the inflammation* may not enter into *the middle ear and cause life-long deafness, and perhaps ulceration of the ear, with discharge.*

Patients recovering from scarlet fever should not be allowed to leave their room for three or four days after the attack.

For the treatment of the dropsy that sometimes follows scarlet fever, see *Dropsy*.

Severe cases of scarlet fever demand the best skill, experience, and patience of the physician.

SCIATICA.

Sciatica is a very painful affection of the great sciatic nerve. This is the largest nerve of the body; it runs from the posterior part of the hip-joint down the back of the thigh to the ham. In severe cases of sciatica, the pain extends along the whole course of the nerve, and is so distressing during the night that the patient is completely prevented from sleeping; sometimes it is accompanied by quick hard pulse, thirst, foul tongue, and the usual symptoms of fever. In chronic cases the patient occasionally suffers from cramp, and a sensation of tingling and numbness is felt in the limb. In long-protracted cases the limb shrinks, and the patient has great difficulty in keeping it warm. This affection generally arises from exposure to cold and moisture, and occurs chiefly in adults, and people advanced in life. In females it not unfrequently comes on during pregnancy, and after labor. Sciatica is a form of neuralgia. (For treatment, see *Neuralgia.*)

SCROFULA.

Scrofula, in the general sense of the term, consists of a morbid deposit, called tuberculous matter, which commonly appears in small tumors or knots called tubercles.

The lungs are more frequently affected with scrofula than any other internal part; in that organ it is manifested at first in the form of numerous small tubercles, which, after remaining in a latent state during a longer or shorter period, gradually increase in size, then soften, and cause incurable consumption. (See *Consumption.*)

No age confers complete immunity from scrofula, but different periods of life render some organs more liable to be affected than others. The parts of the body in which the vital functions are most active are more particularly subject to the disease. Hence tubercles of the brain frequently occur in infancy and seldom in grown-up people, because in the former the brain is the seat of constant and strong functional action. The glands of the neck are most frequently affected during the process of teething, probably in consequence of the continued irritation about the jaws which this occasions. *External* scrofula seldom *originates* after puberty; on the other hand, consumption, or as it may be termed, scrofula of the lungs, chiefly occurs in adults, in consequence, it is presumed, of the greater activity of the lungs at this period of life. At a more advanced age, when the digestive organs are stimulated to a greater extent and the abdomen increases in size, the liver and other organs contained within that cavity are almost exclusively the seat of the disease. Irritation of the stomach and bowels may develop scrofulous disorders of the mesenteric glands at any time of life; this variety of the disease, however, is more commonly met with in children.

Scrofula appears to be so mixed up with the very elements of existence, that it has the effect of modifying the symptoms of a great part of the diseases to which the body is liable. The effects of this influence are more particularly observed when syphilis and diseases of the eye occur in individuals of scrofulous constitutions; and the unmanageable and obstinate character which many inflammatory diseases acquire when modified by a scrofulous taint in the system is well known to medical men. It is also well known that wounds and other injuries of the soft parts in scrofulous people are often very slow in healing. In many chronic diseases connected with scrofula it is frequently found necessary to administer tonic and stimulant remedies, which in the same diseases under other circumstances would be inadmissible.

Causes.—Many causes are said to give rise to scrofula; in fact, every agent, moral or physical, which depresses the energies of the system tends to develop the disease. One of the most powerful of these is, without doubt, the long-continued action of a cold moist atmosphere. The injurious influence of this cause will be greatly aided by defective or unwholesome diet, want of cleanliness, sedentary habits, living in confined situations, where the atmosphere is not renewed and the direct light of the sun is excluded.

There cannot be the slightest doubt that impure air and the absence of the direct solar rays exercise a powerful influence on inducing scrofulous affections; this is shown by their greater prevalence among the inhabitants of large towns than among those who breathe the pure air of the country.

We see the influence exercised by climate over this disease in the aggravation of the symptoms during the spring and winter seasons, whereas in the summer months scrofulous sores generally improve or disappear altogether. All external agents, all circumstances which reduce the energies of the system below the natural standard (more especially when conjoined with atmospheric humidity and cold), are exciting causes of scrofula. The children of scrofulous parents, under whatever circumstances they may be placed, are more liable to the disease than the children of healthy parents in parallel circumstances.

Our limits will not allow us to notice in detail the various means recommended to prevent the development of the disease in children predisposed to it; but we may say with the celebrated philosopher, Hunter, "let an infant have plenty of sleep, plenty of milk, and plenty of flannel;" these, when conjoined with plenty of pure air, are the principal objects in domestic treatment to be observed during infancy, and should be strictly attended to from the very first hours of birth.

The cold bath is improper for newly-born or very young children; in the delicate, and those in whom there is reason to suspect a disposition of scrofula, it increases the debility, and may lead to very injurious consequences. The cold bath, however, agrees well with many children; this is evinced by their soon becoming warm and appearing lively after being taken out of the water, whereas in others it has an opposite effect; they continue chilly and pale for some hours afterwards, and the faculties of the body appear, as it were, overpowered. But although cold bathing is generally inadmissible, washing the body with warm or tepid water is necessary, not only with respect to cleanliness, but also to promote the healthy functions of the skin.

As the child grows up constant care is required in regulating the diet. This should consist principally of animal food, taken at regular intervals, but never in such quantity as to overload the stomach.

All healthy children have a natural desire for exercise, than which nothing is more conducive to the digestion of the food, the circulation of the fluids, and the health and growth of the body. To scrofulous children, or those who have a predisposition to the disease, plenty of exercise is indispensable, and should always be taken in the open air when the weather is fine; otherwise they should be allowed to play in a large well-aired room. A judicious writer of the last century, Dr. Cheyne, speaking of the advantage of exercise to children, says: "'Tis beautiful to observe the earnest *desire* planted by *nature* in the young persons to *romp*, *jump*, *wrestle*, and *run*, and constantly be pursuing *exercise* and bodily *diversions* that require labor even till they are ready to drop down, especially the healthier sort of them, so that sitting or being *confined* seems to be the greatest *punishment* they can suffer; and imprisoning them for some time will much more readily correct them than *whipping*. This is a wise contrivance of nature, for thereby their joints are rendered *pliable* and *strong*, their blood continues sweet and proper for a full circulation, their perspiration is free, and their organs stretched out by due degrees to their proper extension."

Without the assistance of pure country air, children are not likely to derive much benefit from any other means. We ought therefore to make choice, as far as lies in our power, of a dry and temperate atmosphere, untainted with exhalations, and known by experience to be salubrious; and sudden extremes of heat and cold should be avoided as much as possible.

Sea-bathing, when judiciously managed, is one of the most valuable remedies that can be employed in scrofulous disorders. In delicate children the sea water should be used warm at first, then tepid, reducing the temperature by degrees until the system is prepared to withstand the shock of immersion in the open sea.

All scrofulous people of delicate constitution, and those affected with chronic diseases, should wear flannel constantly next the skin; this is the best safeguard in protecting the body from the injurious influence of damp and variable climate, and, although it may be worn of a thinner texture during the warm weather, *should never be entirely thrown off*. Flannel gently stimulates the skin, promotes the insensible perspiration, while it absorbs the moisture as it is thrown out, and tends greatly, under all circumstances, to keep up an equable temperature; this last is an object of much importance where there are great and often sudden vicissitudes of the temperature of the climate.

The giddy practice of throwing aside our winter garments too early in the spring, and of exposing our bodies, when overheated, to sudden colds, has destroyed more than famine, pestilence, and sword.

Much depends, in counteracting the disposition to scrofulous maladies, upon the management of childhood. If the physical education of early life is of the utmost importance, the moral training, even from the earliest dawn of reason, also demands the strictest attention. Parents should commence early to discipline the minds of children and *train them to habits of obedience, for on this their future health in a great measure depends.* How often do we see that those who have been over-indulged and pampered when children are unable in after life to control their appetites and passions, and thus cause the disease to be lighted up in the lungs, when it otherwise might have remained quiescent or inactive during a long lifetime.

A great variety of drugs have been employed in the treatment of scrofula, but they are all of secondary importance in comparison with the means above recommended. A remedy much used at present, and which is generally understood to possess a greater influence in overcoming scrofulous affections than any other medical agent hitherto discovered, is *iodine.*

Iodine, one grain,
Iodide, two grains,
Distilled water, eight ounces. Mix.

To a child under seven years of age, a dessert-spoonful of this mixture is to be given three times a day, in half a teacupful of water, sweetened with a little sugar.

The dose should be gradually increased to two tablespoonfuls, and the remedy is to be continued, if no untoward symptoms occur, for a period of four or five weeks; its use is then to be suspended, and gentle laxatives are to be administered. After an interval of a fortnight the mixture is to be again administered, commencing with a dessert-spoonful, and gradually augmenting the dose as before. At the expiration of a month the remedy is to be again discontinued, and again renewed. In this manner iodine may be employed with perfect safety, and continued until the cure is accomplished.

For adults the following formula will be found convenient:

Iodine, ten grains,
Iodide or hydriodate of potash, twenty grains. Mix.

From four to twelve drops, to be taken in a glass of water, three or four times a day.

During the internal administration of iodine, the following ointment may be employed externally:

Iodurot of lead, a drachm,
Lard, an ounce. Mix.

About the size of a nutmeg, or a larger or smaller quantity according to the bulk of the swollen glands, is to be rubbed in every night during six minutes.

In adults it should be applied in this manner twice a day. This ointment, spread on soft linen or lint, is also an excellent application to scrofulous sores.

In addition to iodine, scrofulous patients do well to take *cod-liver oil*, *cream*, and abundance of nourishing food—beef, mutton, fish, and beef-tea—outdoor air, sunlight, sea-bathing, and all tonic measures.

Scrofulous diseases oftentimes fall into the domain of surgery, and demand operative procedures and mechanical appliances. (See *Hip Diseases; Spine, Diseases of.*)

Scrofula can never be cured rapidly, inasmuch as it is the result of a morbid change affecting the entire organization of the body; and we repeat, that the best means, not only of preventing, but of controlling and removing this obstinate disorder, are proper diet and clothing; pure, dry, and warm air; and regular exercise. It must also be borne in mind, that though the medicines above mentioned are of the greatest service, it is only when they are employed with steady and patient perseverance, aided by the strictest attention to the rules requisite for the improvement of the general health.

SCURVY.

Scurvy evidently arises from a depraved state of the blood, caused chiefly, if not altogether, from want of fresh animal and vegetable food. The blood, when in a natural state, stimulates and nourishes every organ and structure of the body; but when this vital fluid is altered in quality, it is no longer capable of fulfilling the purpose for which it is destined, and the whole animal economy suffers in consequence. The first symptoms which announce this morbid change in the circulation are general weakness, disinclination to move about, great lassitude after any ordinary bodily exercise, dull, heavy pains in the back and limbs, great depression of spirits, disturbed sleep, weak and frequent pulse, loss of appetite, slow digestion, cold dry skin, hurried breathing and palpitation of the heart on walking a little quicker than usual, or from any other bodily exertion. A sailor, for example, on going aloft experiences the two last-mentioned symptoms, along with a sensation of giddiness, and a feeling as if he were about to faint.

This stage of the disease often continues a considerable length of time, and is at first little noticed; but at last the signs which more particularly characterize the disease make their appearance. The skin, which is at first unusually pale, gradually assumes a dingy yellowish hue; the face looks puffed or bloated; the gums become swollen, dark, red-colored or livid, spongy, and bleed from the slightest friction. As the disease advances the teeth loosen, the gums ulcerate; fungoüs excrescences shoot up from the ulcers, and the breath acquires an exceedingly offensive smell. The urine also emits a peculiarly disagreeable rank odor, and appears muddy and high colored. While the gums become gradually affected in the manner above described, dark-colored spots at the same time make their appearance on the calves of the legs, on the thighs, sometimes on the arms and back, rarely on the face; these run into each other, and form large blotches of a yellowish, greenish, or livid color, similar to the marks which follow bruises or blows. The small, round, purple-colored spots, and the large, discolored, bruise-like patches are most frequently seen on the lower extremities, and both are the consequence of effusion from the blood-vessels. Ulcers in many cases form on the legs, and soon present an appearance peculiar to scurvy; the edges of the sore are of a purplish color, and appear as if inflated; a thin acrid fetid matter is at first discharged; but as the disease advances, a dark-colored covering of coagulated blood is deposited upon the surface of the ulcer, which is not easily removed, and is soon replaced by a similar coagulum. The surface of the sore under this dark-colored mass is soft, putrid, and spongy, like the gums, and bleeds from the slightest cause. As the disease gains ground, the knee-joints contract, the hams become swollen, hard, and painful; and in two cases we have seen, the calves of the legs were hard like a piece of wood, so that the skin covering them could not be pinched up between the finger and thumb. In most cases the nostrils bleed occasionally, and blood is discharged from the bowels. Such are the symptoms of scurvy as we have observed them on board of ship in northern latitudes, all of which vanish in a surprisingly short time when the natural remedies—vegetables and fresh animal food—can be procured.

Towards the termination of the disease, one of the most remarkable symptoms is the tendency to swooning on any bodily exertion. It has also been observed, that the appetite for food generally continues to the last. "Many of our people," says Mr. Walter, in the Narrative of Lord Anson's Voyage, "though confined to their hammocks, ate and drank heartily, were cheerful, and talked with much seeming vigor, and in a loud, strong tone of voice; and yet, on their being the least moved, though it was only from one part of the ship to another, and that in their hammocks, they have immediately expired; and others, who have confided in their seeming strength, and have resolved to get out of their hammocks, have died before they could well reach the deck. And it was no uncommon thing for those who could do some kind of duty and walk the deck, to drop down dead in an instant on any endeavors to act with their utmost vigor; many of our people have perished in this manner during the course of the voyage."

Causes.—The grand cause of scurvy is the want of fresh animal and succulent vegetable food, more especially of the latter; and the disposition to the disease from this cause is, no doubt, greatly promoted by long exposure to a cold damp atmosphere, fatigue, long-continued watching, deficient exercise, mental distress, and, in a word, all the debilitating causes which depress the powers of life.

Treatment.—Such is the power which we now possess in preventing scurvy, that many surgeons of the British navy of long standing have never seen a case of it. But the crews of merchantmen, during long voyages, often suffer severely from this disease, in consequence of being obliged to live on unwholesome food; from this cause alone many valuable lives are annually lost. Hard bad beef, and worse biscuit, constitute the only food which the sailors in some vessels are allowed for weeks together. The biscuit is often so hard that it cannot possibly be masticated without previously soaking it in water.

The means to be adopted in order to preserve the general health of seamen, and consequently to prevent scurvy, consist in wholesome food; that is to say, the articles of victualling generally used on board of ship should be sound, and of good quality; in an abundant supply, when in port, of fresh animal and vegetable diet, more especially of succulent vegetables and fruit; in a plentiful supply of lemon-juice, without which no vessel should ever proceed on a distant voyage; in personal cleanliness, exercise, and cheerfulness; and in strict attention to ventilation, cleanliness, and dryness of the ship.

Lemon or lime juice, in the absence of fresh vegetables or fruit, is now admitted on all hands to be the best preventive of scurvy, and also the best remedy after the disease makes it appearance. This juice is preserved by mixing a tenth part of brandy with it. The first account we have of the use of lemon-juice in scurvy is in a curious old work by John Woodall, surgeon of St. Bartholomew's Hospital, published in 1636, entitled the "Surgeon's Mate, or Military and Domestic Medicine." "And further experience," says the author, many of whose observations are very judicious, "teacheth, which I have oft found true, that where a disease most raigneth, even there God hath appointed the best remedies for the same grief, if it be his will they should be discovered and used; and note, for substance, the lemmons, limes, tamarinds, oranges, and other choice of good helps in the Indies, which you shall finde there do farre exceed any that can be carried thither from England; and yet there is a good quantity of juyce of lemmons sent in each ship out of England by the great care of the marchants, and intended onely for the reliefe of every poore man in his neede, which is an admirable comfort to poor men in that disease; also, I finde we have many good things that heal the scurvy well at land, but the sea chirurgeon shall do little good at sea with them, neither will they indure. The use of the juyce of lemmons is a precious medicine, and well tried, being sound and good; let it have the chiefe place, for it will deserve it; the use whereof is: It is to be taken each morning, two or three spoonsful, and fast after it two hours; and if you adde one spoonful of *aquavitæ* thereto to a cold stomack, it is the better. Also, if you take a little thereof at night, it is good to mixe therewith some sugar or to take of the syrup thereof is not amisse. Further note, it is good to be put into each purge you give in that disease. Some chirurgeons also give of this juice daily to the men in health as a preservative, which course is good if they have store, otherwise it were best to keep it for need. I dare not write how good a sauce it is at meat, least the chiefe in the ships waste it in the great cabins to save vinegar. In want whereof, use the juice of limes, oranges, or citrons, or the pulpe of tamarinds." In another part of the work he remarks, "And generally note, that bitter and sower medicines prevail most to the cure of this griefe, amongst which you have that are approved good thereto; those that follow as chiefe, juyce of lemmons, of limes, of citrons, and oranges. In like manner, the juyce or pulpe of tamarinds hath a great acetositie, and is found a precious remedy against the disease."

Another excellent and cheap remedy, though inferior to lemon-juice, is *sour krout*, which "is prepared by slicing the soundest and most so:d cabbages in the way cucumbers are used in this country. In this state they are put into a barrel in layers, hand high, and over each is strewed a handful of salt and caraway seeds; in this manner it is rammed down, layer above layer, till the barrel is full, when a cover is put over it, and it is pressed down with a heavy weight. After standing for some time in this state it begins to ferment, and it is not till the fermentation has entirely subsided that the head is fitted to it, and the barrel is shut up and prepared for use."

The preparation of oatmeal, well known in Scotland under the name of *sowens*, has been proved to be very efficacious both in preventing and curing scurvy. It is prepared by putting some oatmeal into a wooden vessel, pouring hot water upon it, and allowing it to stand for two or three days in a place moderately warm until the liquid ferments and becomes sour. The liquid is then removed from the grounds, and boiled to the consistence of a jelly; it may be sweetened with raw sugar, and flavored with a little cinnamon.

When no lemon-juice can be procured, good effects result from the use of an ample daily allowance of *molasses* and *vinegar*.

A great variety of medicines have been employed in scurvy; but they are all insignificant in comparison with fresh succulent vegetable juices, as lemon-juice, &c., and it appears questionable whether they ever produce any good effect.

Patients are sometimes much troubled with constipation of the bowels. When this occurs, *castor oil*, tincture of rhubarb, and sulph. of potash will be found the best laxatives. From three drachms to an ounce or more of the latter dissolved in a basin of thin gruel operates mildly, and is perhaps the best opening medicine that can be employed. Opiates at bedtime produce sleep and relieve the patient greatly during the night, but upon the whole they do more harm than good. Mercury is decidedly injurious, and ought never to be given under any circumstances, not even when the disease is complicated with syphilis.

The best wash for the mouth is a weak solution of *chloride of lime*, or *chloride of soda*, or *chlorate of potash*. These may also be used as a local application to ulcers which are induced by the disease. For these, lint soaked in lemon or lime juice, diluted with twice or thrice its quantity of water, is recommended. It is always advisable in such cases to cover the dressing with oiled silk to prevent evaporation. A *solution of alum* in water, in the proportion of two drachms to the quart, is an excellent application for spreading or sloughing sores of this kind.

On the subject of scurvy I quote the following very interesting remarks from Aitken:

"The early history of navigation, as it records the greatest ravages of scurvy, so does it also record the best antidote to the disease. Of four ships which sailed from England in the beginning of April. 1609, for the establishment of the East India Company, they were all so severely visited by scurvy as to have lost nearly one-fourth of their crews when they arrived at the Cape of Good Hope. The crew of the Commodore's ship was not attacked. This immunity arose from three tablespoonfuls of lemon-juice having been served daily to each of his men. But notwithstanding this evidence of the success of lemon-juice in preventing scurvy—evidence the most conclusive—this valuable remedy and preventive was altogether slighted for a hundred and fifty years afterwards.—*Copland.* Lord Anson's people, in 1740, on reaching the Island of Tinian, were recovered principally by eating oranges; and that noble, brave, and experienced commander was so convinced of their usefulness, that, before he left the island, he ordered one man from each mess to lay in a stock for future security. Sir Charles Wager's people, also, were terribly afflicted with scurvy in the Baltic. Sailing, however, in the Mediterranean, and having heard how effectual oranges and lemons were in the cure of this disease, he took on board at Leghorn a large quantity of them, ordered a chest each day to be brought on deck, and allowed the men, besides eating what they chose, to mix the juice with their beer, and to pelt each other with the rind, so that the deck was strewed with the fragrant liquor. By these means he brought his men home in good health.

"In the year 1747, Dr. Lind made some comparative trials between this and some other modes of treatment (as vinegar, sulphuric acid, and tamarinds) on board the 'Salisbury,' at sea. As a general conclusion from his experiments, he affirms that orange and lemon juice, or, more properly, the citric acid obtained from all the species of the botanical genus Citrus, or the natural order of fruits called Hesperidæ, are greatly more efficient than any other remedy in the cure of scurvy.

"Notwithstanding this strong opinion of Dr. Lind, the navy continued to suffer severely from scurvy for half a century, till the Admiralty gave a general order for the supply of lemon-juice. This salutary measure was accomplished by a representation from the Medical Board of the Navy, in the year 1795, when Lord Spencer was First Lord of the Admiralty, after a trial made on board the 'Suffolk,' of seventy-four guns.

"This ship sailed from England on the 2d of April, 1794, supplied with a quantity of lemon-juice sufficient to serve out two-thirds of a liquid ounce daily to every man on board, and this was mixed with their grog, with two ounces of sugar. She arrived at the Madras roads on the 11th of September, after a passage of twenty-three weeks and one day, without having had any communication with the land, without losing a man, and having only fifteen on the sick-list. Scurvy appeared in a few of the men during the voyage, but disappeared on an increased dose of lemon-juice being administered. 'Let this fact,' says Sir Gilbert Blane, 'be contrasted with the state of the Channel fleet in 1780, when Admiral Geary's fleet returned into port after a ten weeks' cruise in the Bay of Biscay, with 2400 men ill of scurvy; and let the state of this fleet be contrasted with that of the Channel fleet in 1800, which, by being duly supplied with lemon-juice, kept the sea four months without fresh provision, and without being affected with scurvy.'"

The same authority advises the following course of treatment:

"1. Keep a supply of fresh vegetables by all means in our power. Even unripe fruits are better than none, and we must risk a little diarrhœa for the sake of their anti-scorbutic properties. In time of war every vegetable should be used which it is safe to use, and when made into soups all are tolerably pleasant to eat.

"2. The supply of dried vegetables, especially potatoes, cabbage, and cauliflowers, turnips, parsnips, &c., are perhaps less useful; dried peas and beans are useless. As a matter of precaution, these dried vegetables should be issued early in the campaign, but should never supersede the fresh vegetables.

"3. Good lemon-juice should be issued daily (one ounce), and it should be seen that the men take it.

"4. Vinegar (half ounce to one ounce daily) should be issued with the rations, and used in the cooking.

"5. Citrates, tartrates, lactates, and malates of potash should be issued in bulk, and used as drinks or added to the food.

"The easiest mode of issuing these salts would be to have packets containing enough for one mess of twelve men, and to instruct the men how important it is to place them in the soups or stews. Possibly they might be mixed with the salt, and issued merely as salt." —*Pract. Hygiene*, 2d ed., 1866, p. 466.

It should be remembered that scurvy is not confined to the sea. It may also break out, though usually in a milder form, on land, among those who are fed on a too exclusive diet, and are long deprived of acids and fresh good food. Scurvy is a powerful argument against *exclusiveness* of diet. Man needs a variety of food.

SCUTELLARIA (BLUE SKULLCAP).

Scutellaria is a most excellent *nervine*. It calms, soothes, quiets the agitated patient in convulsions, in *St. Vitus's dance*, in *hysteria*. It seems to act very much like valerian, only with greater power. In general nervousness and *sleeplessness* it is found to be of great service, though far inferior to *bromide of potassium*. The remedy is not yet very extensively used. I am inclined to believe that it will gain in popularity. It may be combined with other *nervines* and *anti-spasmodics*.

The dose is from *one to five* grains.

SEA-SICKNESS.

This affection is very common and very disagreeable, and by no means as beneficial as is commonly believed.

I regard sea-sickness as essentially a nervous disorder—a disturbance of the nervous system caused by the motion of the ship. Just what this disturbance is, just how the nervous system is affected, science has not yet demonstrated. It is not necessary to go to sea in order to be sea-sick. Many experience sensations similar to those of sea-sickness when they travel by the cars or by the stage, or when they swing or rock in a chair.

The nervous and delicate are more liable to sea-sickness than the hardy and strong. Therefore women suffer more at sea than men.

A friend of mine who has been in the employ of the Children's Aid Society, and who in that capacity has had charge of transporting many hundreds of children to the West, once told me that he always expected that many of the company would be sick after travelling a day or two in the cars.

The difference between the sickness of those who travel by land and those who travel by sea seems to be only one of degree, and not of kind.

The term sea-sickness is really an unfortunate one. *Travellers' sickness* would better express the character of the disease.

Sea-sickness is not always or necessarily accompanied by *vomiting*. Headache—quite similar in its sensations to the ordinary sick headache—is a very common symptom.

Great exhaustion, *constipation*, are among the unpleasant symptoms that accompany or follow the disease.

I have said that sea-sickness was not as beneficial a process as is commonly supposed. There are many who, after a voyage at sea or a long trip by land, find it necessary to rest for several days before they recover their usual strength.

The benefit that comes from a voyage by sea or a trip by land is due to the change of scene, the passive exércise, the prolonged rest, the freedom from labor and anxiety, and the tonic effects of the air. These influences are beneficial in spite of the sea-sickness.

On this subject I speak from a considerable observation and personal experience while acting as surgeon in the navy.

I then improved my opportunities to study the treatment of this disease, and I came to the conclusion that it is by no means wholly unrelievable.

The plan of prevention and treatment that I propose is as follows:

1. Go on board of the ship in as good a condition as possible. It is not necessary to use violent purges. The great thing is to have the nervous system in as healthy a state as is possible, consistently with the labor of preparation. Those who embark in a condition of exhaustion will be likely to be the greatest sufferers from sea-sickness. *Eat a substantial meal just before embarking.*

2. Before the vessel is fairly at sea—better still (as Dr. Fordyce Barker advises), before she leaves her moorings—retire to your berth in some loose clothing, and lie flat on your back for at least twenty-four hours. Do not get out of your berth at all, if it is possible to avoid it. Give no heed to those who urge you to go on deck.

3. Eat some light and digestible food three or four times a day. Do not allow the stomach to be long empty.

4. If nausea or headache comes on, try the following remedies:

Tincture of capsicum (cayenne pepper).—A few drops of this in a tumbler of water should always be kept at hand. Whenever unpleasant sensations arise in the stomach or head, take a swallow. I have found this to be a most excellent remedy.

Oxalate of cerium.—This may be taken dry on the tongue. The dose is about as much as can be placed on the point of a pen-knife.

Ice to the spine. (See *Ice-bags.*)

This method of treatment is strongly recommended by Dr. Chapman, the inventor of the ice-bags. Although his theoretical arguments are not yet susceptible of demonstration, yet practically the application of ice to the spine exercises great power over the nervous system. The remedy is worthy of a trial. It is not necessary to have ice-bags. Pieces of ice may be wrapped in a towel and applied to the spine.

The advantage of the ice-bags is, that they are neater and more convenient than any other method of applying ice to the spine.

5. *Electrization* and *hypodermic injections* have been recommended for sea-sickness. These remedies, however, can only be

used by a physician, or at least by some unusually reliable and skilful attendant.

After spending twenty or thirty hours in the berth, it will usually be safe to go on deck, unless the sea should be exceedingly boisterous.

It is well to prepare the few simple medicines before embarking, and to have them near at hand.

Mental diversion and *force of will* assist very materially in the prevention of sea-sickness. One of the best methods of diverting the mind is reading novels or other entertaining works.

Whenever I take a sea-voyage I always take with me some light and entertaining reading, as an indispensable part of my outfit. One can read, with some little difficulty, while reclining in the berth.

SEMINAL EMISSIONS, OR SPERMATORRHŒA.

The views that I shall present on this subject will be directly opposed to those which are commonly entertained. I may say at once that nearly all the writings on this subject to which the people have access are erroneous. The views that have been advanced on this and many other affections of the genital organs have come from ignorant, unscrupulous, and designing men, whose opinions on this or any other subject are valueless.

1. *Seminal emissions are not necessarily a disease.* For one who is unmarried and in good health, the voluntary emission of seminal fluid is, within reasonable limits, both natural and healthful. But for the teachings of bad books, this fact would be recognized. Involuntary emissions only become a disease when they are inordinately frequent. The question now arises, What is meant by the term inordinately frequent? This it is impossible to answer mathematically. I have said that it was impossible to lay down any rules concerning the quantity of food that we should take, or of stimulants and narcotics that we should use, that should cover every case. Just so it is impossible to say how many emissions of seminal fluid can be borne without injury. Some are apparently injured by one emission a week, while others have several weekly, and maintain perfect health and strength.

Seminal emissions should *never excite any alarm so long as our health in other respects remains good.*

Let the genital organs take care of themselves so long as our digestion is good, our sleep sound, and our strength firm; and when we do begin to take treatment, take the first and chief care of the general system.

2. *Seminal emissions are not so frequently the cause of nervous and other diseases as is commonly supposed.*

In science, as in other departments, serious mistakes are made by confounding effects with causes.

Seminal emissions are the *effects* as well as the causes of disease, and should be so considered.

Anything that weakens the nervous system may bring on seminal emissions. Exhausting fevers, dyspepsia, diseases of the brain and spinal cord, constipation, &c., &c., may give rise to over-frequent seminal emissions. Persons recovering from exhausting diseases oftentimes experience this trouble for several weeks. It usually lasts for a short time only, and disappears as the patient resumes his usual strength. The great fact to be remembered is, that seminal emissions, when in excess, are symptoms of general debility.

There is no question that in turn they do have a debilitating influence on the system, but only when they are in considerable excess, and by no means to the extent that is commonly supposed.

There are probably cases of insanity, of imbecility, and of death brought on by self-abuse and spermatorrhœa, but I am inclined to the opinion that such cases are exceptional.

This leads us to the consideration of the important subject of

SELF-ABUSE, OR MASTURBATION.

This habit, when commenced early and carried to a great extreme, injures the nervous system, but it acts very differently with different constitutions. It makes a very material difference whether the habit is begun in very early life or after the age of twenty.

The earlier the habit is formed, other conditions being the same, the more injurious it is.

The habit is almost universal. It is indulged in by both sexes. It is not confined to civilized lands. The semi-barbarous and the savage are addicted to it. It is not confined to the human species, for animals also acquire it.

The wonder is, not that it does so much injury, but that it does so little; that so few comparatively are permanently injured by it.

I know very well the popular feeling on the subject; but I also know that almost all the ideas now prevalent among the people concerning this habit, and the diseases to which it gives rise, are borrowed from unprincipled and ignorant quacks, who have availed themselves of the ignorance of society on these matters to fill their own pockets.

In order not to be misunderstood on this important subject, I sum up my views in the following propositions:

1. The involuntary emission of seminal fluid is *not usually a disease*, and therefore does not, in the majority of cases, need any treatment. For an adult male in good health, and who is unmarried, it is a process that is a natural result of his continence, and is not usually injurious.

2. In some cases the emissions are so frequent that they may be regarded as a *symptom* of a relaxed and debilitated condition of the body, and should be treated, if they are treated at all, *not locally*, but by *strengthening the general system*. The cases where these involuntary emissions are directly injurious to the constitution are much less frequent than is commonly supposed. In the majority of cases excessive frequency of seminal emissions is an *effect* rather than a cause of disease.

3. The number and frequency of emissions that may be consistent with perfect health *cannot be determined by any mathematical rules*. What may be a sign of perfect health in one may in another be a symptom of general debility. It is just as impossible to lay down mathematical rules that will apply to all constitutions on this subject, as it would be to lay down definite rules concerning the quantity of food that we should eat, of water that we should drink, or of exercise that we should take. So long as the general health remains good, seminal emissions should never *cause us a moment's thought, even though they may be frequent.*

4. The true way to treat seminal emissions when they are, or are supposed to be, more frequent than is consistent with health, is usually *not to treat them at all.* Take good care of the general health. Strengthen the constitution by every agreeable method. Live generously. Work hard, keep brain and muscle active, and *let the genital organs take care of themselves.*

This advice, if acted upon, would save a multitude of unnecessary sorrows.

As soon as convenient get married, but at all events keep diligently at work.

5. In those exceptional cases where there is some real difficulty of the genital apparatus—some irritability of the urethra, or other slight morbid condition—do not attempt self-treatment, but consult some honorable and judicious physician, in whom you have reason to feel confidence, and submit to his direction just as you would for any other disease.

6. Self-abuse is by no means as injurious a habit as is commonly supposed. The habit is universal in both sexes, and among all nations—the barbarous and semi-civilized, as well as the enlightened. If it were as prejudicial to the constitution as is currently believed, the whole earth would be converted into insane asylums, and hospitals for epileptics. When practised to great excess, especially by those who are very young, it undoubtedly does work injury, but even in early years it is not as injurious as excessive sexual intercourse. Young boys who go to great excess with the women injure themselves more than those who practise self-abuse. The truth is, that the genital organs, like the stomach, can bear and were designed to bear a vast amount of abuse. Had it been otherwise, the human race would long since have perished from the earth.

This remark is not made to justify the revolting habit in any one, but to present the actual truth on this subject, which all persons everywhere should understand and appreciate.

Although the habit of masturbation, when begun in tender years, and carried to great excess for a long time, may give rise to or aggravate epilepsy, St. Vitus's dance, insanity, and other nervous affections; yet such instances are far less frequent than is generally believed. The insane are oftentimes addicted to this habit; then it is the *result* of their insanity more frequently than its *cause*.

Any injury that comes from this habit or from excessive sexual intercourse is due not so much to the loss of the semen—which is comparatively a trifling matter—as to the *nervous excitement*. But often the evil effects of this habit are chiefly felt on the moral nature. *It destroys self-respect.*

7. *Impotence* is usually, though not always, a disease of the *imagination*. To one person who is really incapable of performing the sexual act there are one hundred who suppose themselves to be so. The treatment for imagined impotence is usually the same as that for seminal emissions. Do not treat it at all. Go to work. Develop your muscles and brain. Devote yourself to money-making. Resolve to become useful or famous. The activity which will be necessary in carrying out these ambitions will divert your mind from your imaginary evils, if they are imaginary, and will be the best means of cure if they are real.

If you wish to get married, do so without a moment's hesitation, and without even asking whether you are or are not capable of performing the sexual act. In the great majority of cases patients after their marriage forget all about their imagined impotence.

It is very natural to inquire why it is that young men are so inclined to worry and become hypochondriacal on imagined disorders of the genital organs. Why is it that the slightest disease or suspicion of disease of the genital apparatus causes such absurd and unnecessary mental depression? The explanation is to my mind quite clear. *The great sympathetic nerve is at fault.* This nerve sends prominent branches to the *stomach* and to the *genital organs.* Therefore these three—the *brain*, the *stomach*, and the *genital apparatus*—are in very distinct and close sympathy with each other. They form a kind of family. They are in constant telegraphic communication with each other, and any injury of one is soon felt by the other two.

In the light of this explanation we see also why it is that *dyspepsia* so frequently causes depression of spirits.

Another reason why patients worry over and exaggerate their genital difficulties is the peculiar, and, to a certain extent, unnecessary privacy that is associated with the genital function. The desire for sexual intercourse is the most powerful passion of human nature, for the reason that it is indispensable to the perpetuation of the species, and yet children are brought up in blank ignorance of the structure and functions of these organs; are *compelled* to learn through vile associates and evil communications what they should have been taught at home and under parental guidance.

Finally, patients get false and exaggerated ideas on these subjects through the published writings of quacks, for the profession have written little or nothing for the people concerning the genital apparatus. Let me say in conclusion, that almost all that is written on this subject, to which patients will be apt to gain access, is not only wrong, but is *terribly*, *criminally* wrong, and should not be heeded for an instant.

These views on this subject I have long held, and on several occasions have presented them to the profession and to the students to whom I have lectured. I am well aware that they are radically different from the views that have been generally held and adopted by the profession as well as by the people. I have therefore been interested to find some of these substantially confirmed by one of our highest authorities in this department, Prof. W. H. Van Buren. In a lecture recently published in the *New York Medical Gazette* he remarked as follows:

"Masturbation is a subject that cannot escape attention in connection with the etiology of this so-called spermatorrhœa; but I have very little to say upon it. There is no doubt of the generality of the practice; as little doubt, I think, that it is less harmful to the *physique* of the individual than to his *morale.* It does its harm to the man's self-respect, by giving him daily proof that his cannot hold the pre-eminence that belongs to it. It destroys his manliness, his higher qualities, in this way; and that is the reason the young man cannot look you in the face. That the practice is physically hurtful I am not prepared to admit. I have never seen any very striking evidence of it except the so-called spermatorrhœa, which I have told you is a disease of function and of the mind rather than of the body. There is no question that this habit has a vast deal to do with spermatorrhœa. But, on the other hand, in our Southern States, in old times, I have seen many an instance where a boy has gratified himself in the natural way from the earliest dawning of the sexual appetite, even before puberty; and I have seen much more come from excesses of this kind than from masturbation. And, moreover, I have seen bad effects from masturbation, even where there was free access to the natural gratification among the slaves. The difference between the *morale* of the Southern young man and that of the Northern was very marked in the days when our medical classes were divided about equally between them; and from the many examples I have seen of the peculiar effect of the 'peculiar institution' upon the white race, I think we have nothing to regret in its loss. Similar conclusions might be drawn from the social status in Oriental countries, where the young male inclined to yield to temptation has the means of indulgence freely open to him.

"The causes, then, of this functional disease may be summed up in a word—ungratified desire. Whatever begets this desire produces a flow of blood to the prostatic portion of the urethra; and every time this congestion occurs in an unnatural way it leaves behind it a weakened condition of the parts."

SENNA.

Few domestic remedies are more extensively employed than senna, and it may be taken with perfect safety in almost every disease where laxatives are required. The simple infusion is prepared by pouring six ounces of boiling water over three drachms of the leaves, and letting it stand near the fire for at least half an hour. Half a cupful to a cupful or more of this may be given to children. Dr. Paris states that the nauseous taste of this infusion is covered by mixing it with *Bohea tea*, sugar and milk being added in the same proportions as in common tea. The infusion is more frequently given in combination with salts, &c., in the form of the black draught.

The *electuary of senna*, or *lenitive electuary*, is a mild and very useful laxative; it is generally recommended in cases of piles, to pregnant women, and for habitual costiveness.

SHINGLES.

This singular disease is characterized by an eruption of vesicles, extending in a semicircular form round one-half of the body. In general the eruption is preceded for two or three days by a feeling of languor, slight headache, occasional rigors or shivering, loss of appetite, and increased quickness of the pulse, with heat, aching, a disagreeable feeling of tingling, and sometimes a stinging or burning pain in the part where the vesicles are about to make their appearance. The eruption usually commences at or near the navel, sometimes at the lower part of the chest, and extends gradually round to the spine; or it breaks out first close to the spine, and follows an opposite course, so as to appear in either case like half a sash about three or four inches in breadth. It very rarely surrounds the body entirely, but sometimes passes upwards across the shoulder, like a sword-belt. The vesicles are filled with a limpid fluid, have a silvery transparent appearance, and are generally distinct, although they are often closely agglomerated, and seem to run into each other. They appear in clusters surrounded by a red inflamed border. Although very minute at first, they enlarge in the course of twenty-four or thirty hours to the size of small pearls, and in the course of three or four days attain their full size, which is about that of a pea. The clusters or patches of vesicles do not all appear at once, but in succession, so that at one part they have arrived at maturity while at another they are only commencing. On the third or fourth day the vesicles begin to lose their transparent appearance, while the red margin surrounding them changes to a purplish or livid hue; they assume a yellowish color, flatten and dry up by degrees, or break; and the matter discharged forms dark-colored scabs, which fall off about the tenth or twelfth day.

This disorder is sometimes very slight, unattended with feverish symptoms, and terminates completely at the expiration of a fortnight; but in most cases it lasts from twenty-five to thirty days, or even longer, and sometimes leaves a severe pain in some part of the skin which has been covered by the vesicles.

Shingles is not a dangerous disease, although always very troublesome, and often painful; the causes which give rise to it are unknown; it occurs most frequently in autumn and summer; and at·

tacks adults in preference to children. It is not contagious, but may attack the same individual repeatedly.

Treatment.—Active treatment is not required in this disease; mild laxatives should be taken occasionally; and as long as feverish symptoms are present the diet should be mild, consisting principally of farinaceous articles, such as sago, arrow-root, rice or bread pudding, &c. All kinds of strong drink ought to be abstained from, but lemonade or any other cooling beverage may be taken freely. To relieve the smarting and tingling sensation, which is often very distressing, the patient may wash the parts affected from time to time with equal quantities of *laudanum* and tepid water. The *oxide of zinc* (commonly called *tutty-powder*) should be sprinkled over the vesicles when they begin to break, with the intention of absorbing the fluid; this has an excellent effect in relieving the irritation, and is preferable to the application of lotions, poulticing, or any other method of treatment with which we are acquainted. Glycerine and rose-water is a good application. (See *Skin, Diseases of.*)

SKIN, DISEASES OF.

The skin is liable to a large variety of diseases that have been variously classified. If I should attempt to give these classifications I should only bewilder my readers and confer no benefit whatever. My remarks will therefore be exceedingly general.

Most of the common diseases, and those which those not medically educated will be most likely to understand, are mentioned in the course of the book. (See *Itch*, *Nettle Rash*, *Tetter*, *Shingles*, *Ringworm or Scald-Head.*) What is said concerning those diseases need not be here repeated.

There are some other diseases of the skin that are liable to those who are beyond the call of a physician, and which are susceptible of relief by simple means of treatment.

Scarlet rash is a very mild disease. In appearance it resembles scarlet fever, but it is less severe, is not accompanied by sore throat, and very soon passes away without treatment.

Eczema is a very common form of disease of the skin. When it attacks infants at nursing-time it is called *milk-crust.* Eczema receives a variety of names, according to the part of the body that it attacks.

Eczema is oftentimes a very obstinate disease, and demands good care, firm patience, and experienced medical advice, if it can be obtained.

If the mother is left to herself, she will be safe in bathing the parts in tepid water and using the *ointment* of the *oxide of zinc*, or a mixture of glycerine and water, equal parts.

Scaly diseases.—Dandruff of the scalp is one form of scaly disease of the skin. (See *Hair*, *Diseases of.*)

Nervous diseases of the skin are not uncommon. *Pruritus or itching*, *neuralgia*, and *numbness* are the principal of these nervous diseases.

This itching is sometimes terrible. It is aggravated by the heat of the bed, and oftentimes sleep is impossible. It is sometimes confounded with itch, but it is a very different disease.

This is a hard malady to treat. The patient needs *tonics* to strengthen the system.

Fowler's solution of arsenic may be given. (See *Fowler's Solution.*) Opium may be given to relieve the pain, or *hypodermic injections* in extreme cases. Baths are sometimes useful.

Numbness is best treated by electrization. The results of treatment of this condition of the skin by general electrization, and sometimes by localized electrization, are delightful.

Neuralgia of the skin is also to be treated by electrization, and in the same way as neuralgia in general. (See *Neuralgia.*)

Parasitical diseases of the skin are those in which parasites are discovered by the microscope.

Itch is one of these diseases. It is caused by a parasite—the *acarus scabiei*. This is killed by sulphur. (See *Itch.*)

Favus of the scalp is a parasitical disease of the scalp. It is a contagious disease. It is best treated by Fowler's solution of arsenic internally, and by glycerine or carbolic acid or tar ointment applied locally to the diseased parts. (See *Ointments.*) In this disease the hair often falls out.

Barber's itch is a parasitical disease. It is contagious. It occurs principally on the chin. It is sometimes given to the customers in barber shops. It may be transferred from one customer to another by dirty razors. Sometimes the beard is destroyed. Here also the microscope shows us a parasite.

Barber's itch is to be treated by cutting the beard short, keeping the parts clean, and applying ointments of nitrate of mercury or carbolic acid. (See *Ointments.*)

Chloasma or *yellow spots* on the body is a parasitical disease. It is treated by Fowler's solution internally, and by the local application of carbolic-acid ointment.

Freckles and sunburn are diseases of the skin that are both frequent and disagreeable, although they are not serious in their character. People very often complain of them, yet rarely think of consulting their physicians for assistance in treating them. The best treatment for sunburn is the application of *cream.*

Moles and birthmarks are affections of the skin that only the surgeon can treat.

Acne, or *pimples.*—With the appearance of this disease every one is familiar. It consists of small, reddish pimples on the face. Sometimes they become hard and large, break, and form scabs.

The disease is caused by anything that injures the system. It is very common in young people.

This disease is usually obstinate. Those who desire to treat themselves locally may try *cold cream* or *glycerine*, which can at least do no harm.

Lupus is a very serious disease. It attacks the cheek, nose. It may last for a long time. The disease should be treated only by the surgeon.

SLEEPLESSNESS, OR INSOMNIA.

This is a very frequent and a very annoying symptom of a large variety of diseases. It is a symptom which, like other nervous symptoms, is increasing in frequency in modern times. It is caused by the same influences that give rise to other nervous disorders. (See *Nervous Diseases.*) *Over-work of the brain*, *over-worry*, or *inordinate indulgence of the passions*, are among the leading causes that give rise to the state of constitution that finds it difficult or impossible to sleep. Sleeplessness is a part of the compensation for our progress in civilization. It is, however, entirely possible for one to be through life a hard brain-worker and yet enjoy abundance of sleep. (See *Sleep*, and *Influence of Occupations on Health and Longevity.*)

Among the exciting causes of *sleeplessness* are *anxiety*, and using the brain too late in the evening. Therefore study, writing, and even reading, attending exciting assemblies, exciting conversation, improper food, and exhaustion of any kind, late in the day, may cause a sleepless night.

TREATMENT OF SLEEPLESSNESS.

1. Correct the general condition. This should be done by obedience to the laws of hygiene, and by adopting every possible measure that will tend to fortify and strengthen the constitution. (For special directions, see *Nervous Diseases, Treatment of.*)

As a rule, whatever helps the general health will promote sleep, for sleep is a thermometer of health.

If we do not sleep, we may be sure that the system is in some way out of order.

2. *To gain temporary relief.*—Take a tepid or warm bath just before retiring. Do not remain in the bath too long. Ten or fifteen minutes will usually be sufficient time. See to it that the water is not *hot*, but simply tepid. Strong constitutions, who are accustomed to the use of water, can bear a cold shower for a moment or two after the warm bath, on the head and neck. This measure is rather heroic, and cannot be indiscriminately recommended. It must be used with great caution by invalids. Sometimes a *hot foot-bath* will induce sleep.

Sleep with the head high. Use two or three pillows. Sleepless persons are usually troubled with a rush of blood to the head. This tendency may be somewhat remedied by sleeping with the head considerably raised.

Take large doses of *bromide of potassium*—say dose of from 10 *to* 40 *grains*—just before retiring, and repeat the dose during the night, if necessary. *Bromide of potassium* is, on the whole, our best internal remedy for sleeplessness. It reduces the volume of blood in the brain and calms the nervous system. (See *Bromide of Potassium.*) There are cases, however, where it does no good whatever.

Such exceptional cases must experiment with other remedies. The best remedy known is opium and its preparations, cold powder (see *Cold Powder*), Dover's powder (see *Dover's Powder*), hops of the "*hop pillow*," lupulin (see *Lupulin*).

Some of these remedies—in the regular doses—may be of service after bromide of potassium. Both *cold powder* and *Dover's powder* contain a little opium. A grain of opium or a grain of morphine may be taken, but opiates are apt to leave unpleasant effects. They often cause headache and nausea the following day. When opium is used for sleeplessness it should be given in as small doses as possible. Sometimes opium aggravates sleeplessness, and all the preparations which contain it must be dispensed with. *Whatever happens, avoid the patent anodynes.*

Alcoholic stimulants sometimes will induce healthful sleep. *Whiskey* or some form of wine may be tried. *Lager beer*, *ale*, and *porter* act like magic with some constitutions. *Smoking* is a soporific to many. In all these matters the only guide is the experience of each individual. *Hoffman's anodyne* and *valerian* may be tried.

But no one should experiment with himself. Protracted sleeplessness is too often a symptom of *serious trouble* of the brain or nervous system, that may demand the counsel and aid of the physician. Many patients injure themselves by a reckless use of opiates.

General electrization is a remedy that I have found, on the whole, more efficacious in sleeplessness, both for temporary and permanent effects, than internal medication. When I have opportunity to employ it I prefer it even to the bromide of potassium. (See *General Electrization.*)

SMALL-POX.

The two principal divisions of small-pox are the *distinct* and *confluent.* In the former the pocks are distinct and separate from each other; in the latter they unite, and the eruption is continuous.

MILD OR DISTINCT SMALL-POX.

The specific contagious principle, or poison, of small-pox remains in a latent state in the system during a longer or shorter period—generally ten or twelve days—and then gives rise to fever. The patient is seized with shivering, which is soon followed by thirst, restlessness, and anxiety; he complains of pain in his head, back, and joints; nausea is always experienced, vomiting generally occurs, and pain is felt at the pit of the stomach. Children usually appear sleepy and oppressed, and are sometimes attacked with convulsive fits.

At the expiration of forty-eight hours, or on the third day from the commencement of the shivering, the eruption makes its appearance in small red spots like flea-bites. These are first observed on the forehead, face, and neck, next on the wrists, and gradually increasing in number and size, extend, in the course of a day or two, over the whole surface of the body; the legs and feet being always the parts last affected. The feverish symptoms abate on the appearance of the eruption; the pulse diminishes in strength and quickness; the pain of the back, headache, and sickness at stomach are greatly relieved; and the patient is not so restless, and the sleep is more refreshing. The numerous red points constituting the eruption are from the first slightly elevated above the skin; on the second day their base becomes enlarged and feels hard to the touch; on the third day, beyond which the eruption seldom continues to be thrown out, a small vesicle or pock, having a central depression, and containing a thin limpid fluid, shows itself on the summit of each pimple. The pocks are now about the size of a small pea, and with an inflamed border of a damask-red color, more or less vivid, according to circumstances. On the sixth day, reckoning from the beginning of the eruption, the central depression disappears, and the fluid, which was at first thin and limpid, is changed to a yellow color, and presents all the appearance as well as consistence of the matter of an abscess. On the following day the pustules on the forehead, face, and parts where the eruption first appeared, burst; and on the eighth day, still counting from the date of the eruption, scabbing commences over the whole body; but on the legs and feet the pustules are slow in reaching maturity, and do not, in many cases, begin to decay or discharge their contents until three or four days after scabs have appeared on the face.

The fever, which had in a great measure or altogether subsided on the appearance of the eruption, recommences when the pocks are ripened; the pulse becomes quick, the sleep is much disturbed, the urine is again scanty and high colored, and sometimes there is delirium at night. This is called the *secondary fever*, in contradistinction to the *primary fever* which preceded the eruption. During three or four days previous to the bursting of the pustules the face and hands are in most cases considerably swollen, and the eyes are closed up. At this period the skin emits a sickly, disagreeable smell, peculiar to the disease; it is tender and more or less painful, accompanied with a distressing sensation of itching throughout the whole period of maturation.

In this form of the disease the secondary fever seldom continues long, the swelling of the face and hands soon subsides, and about the fourteenth or fifteenth day of the eruption the crusts have fallen from the face, neck, and upper parts of the body, leaving the skin of a brown or clarety hue, which sometimes does not disappear for two or three months. In many cases ulceration succeeds the bursting of the pocks, and pits or depressions are the consequences, which continue through life.

CONFLUENT SMALL-POX.

The fever which precedes the eruption in this form of the disease is usually very severe; the symptoms enumerated in describing the distinct variety appear in a much more intense degree; the languor and general oppression, the pain in the back and sickness at stomach are more severely felt; the pulse is quick, contracted or oppressed; delirium often sets in early, and is sometimes of the lower character described under the head of typhus, or the patient is outrageous, and requires to be controlled.

The eruption is thrown out to a much greater extent than in the distinct kind, and this constitutes the principal feature of confluent small-pox. The vesicles appear early on the third day, and are filled with a thin brownish fluid; they never rise to an eminence, but run into each other, forming large patches or blisters, and sometimes the face is completely covered, as if with a mask. The face and head begin to swell on the third or fourth day, the glands of the mouth become affected about the same time, and copious salivation continues until the ninth or tenth day; this symptom is also not uncommon in distinct small-pox. On the fifth day the eyes are closed up, and the limbs are much swollen. As the disease advances the glands of the neck become enlarged, while the head and face are hideously swelled and disfigured, and contrast in a striking manner with the healthy and blooming appearance which the countenance presented only a few days before. When the pustules break, large dark-colored scabs are formed, accompanied with an exceedingly loathsome smell.

There is little or no diminution of the fever on the breaking out of the eruption; the patient continues very restless, the sleep is much disturbed, the skin is hot, and the thirst urgent. With the approach of the disease towards its crisis, the symptoms in many cases become still more alarming; the brain and nervous system are affected as in typhus fever, and a long train of typhoid symptoms are manifested; there is a great prostration of strength; the tongue is dry, tremulous, and protrudes with difficulty; low muttering delirium or a state of stupor comes on; the urine and stools are voided involuntarily; convulsive starting of the tendons, picking at the bed-clothes, and hiccup take place; and the patient dies between the eighth and ninth days of the eruption.

Some patients, however, are fortunate enough to escape all these impending dangers, and the disease reaches the period of decline; but another ordeal, fraught with extreme danger, has still to be gone through. The restorative process has no sooner commenced than a state of general excitement, called *secondary fever*, is lighted up; this occurs in all cases where the inflammation has penetrated to the cellular texture beneath the skin, and is also frequently experienced in children and delicate persons even in the distinct variety of the disease, where the cellular substance is little or not at all implicated. On the ninth or tenth day of the disease, sometimes later, the skin becomes hot and dry, the pustules are hard and scaly, the pulse is increased in frequency, the tongue is white, there is great thirst, and the patient is deprived of sleep. This secondary constitutional disturbance may be complicated with various local disorders; these are sometimes confined to the external parts of the body; in other cases, again, the internal organs are affected.

MALIGNANT SMALL-POX.

In this form of the disease the fluids of the body are in a depraved state, and hemorrhage or discharge of blood takes place from the nose, the gums, the stomach, or bowels; and in females, from the womb. Purple-colored fever-spots make their appearance on all parts of the skin not covered by the eruption. The pocks, as they advance to maturity, instead of being filled with yellow-colored matter (pus), contain a thin bloody-colored serum, and run into each other as in the confluent form above described. There is great prostration of the vital powers, the countenance is haggard, the breathing is hurried and irregular, the urine is dark-colored or bloody, and the patient is affected with low muttering delirium almost from the onset of the disease, although in some instances the intellectual faculties continue unimpaired to the last. This is by far the worst form of small-pox, and almost invariably destroys life between the fifth and eighth days from the commencement of the eruption.

Mild or distinct small-pox seldom proves fatal; but when the disease appears under the confluent form it is much more to be dreaded, and the malignant variety almost invariably proves fatal. The signs which lead us to anticipate a favorable termination are a small and soft pulse, undisturbed sleep, quiet of mind, and a crimson-colored border surrounding the pocks. The unfavorable symptoms are restlessness, sleepless nights, delirium, hoarseness, cough, &c., occurring at an early period of the disease; the appearance of vesicles on the tongue, or the inside of the mouth and throat; a purple or claret-colored margin surrounding the pocks, a white and pasty appearance of the face, and flatness of the pocks on the body and extremities. Purple-colored fever-spots, and loss of blood from the mucous membrane of any part of the body, announce a fatal termination. Infants and people advanced in life seldom recover from confluent small-pox. The most favorable age for receiving the disease is from the seventh to the fourteenth or fifteenth year.

Causes.—In every instance it arises from a specific poison, or contagious principle, derived from some one already affected with the disease. It is well known that the infectious effluvia are contained in the air which surrounds the patient; and also that the seeds of the disease adhere to linen, clothes, bedding, and other things, and may lurk in them a long time in full force, until they are extricated by some cause and occasion the complaint.

Although in Georgia, Circassia, Egypt, and India *inoculation* has been practised from time immemorial, in order to mitigate the violence of small-pox, yet in Europe the practice was unknown for centuries; and the disease swept off tens of thousands during every generation, and left thousands more disfigured, crippled, or blind, burdensome to themselves and distressing to the feelings of others. At last Lady Mary Wortley Montague, whilst with her husband during his embassy to Constantinople, witnessed inoculation, and, being convinced of its efficacy, submitted her children to the operation, which fully answered her expectation. In one of her letters, dated April 1, 1717, she says: "The small-pox, so general and so fatal amongst us, is here entirely harmless, by the invention of *engrafting*, which is the term they give it. There is a set of old women who make it their business to perform the operation. Every year thousands undergo it, and the French ambassador observes pleasantly that they take the small-pox here by way of diversion, as they take the waters in other countries. There is no example of any one that has died in it; and you may believe I am well satisfied of the safety of the experiment, since I intend to try it on my dear little son. I am patriot enough to take pains to bring this careful invention into fashion in England." This highly accomplished and spirited lady fulfilled her promise, and introduced the practice into England in 1721; thence it spread rapidly over all Europe, and deprived this loathsome disease in a great measure of its virulence and fatality. Inoculation, however, was attended with many serious disadvantages, and is now therefore entirely superseded by vaccination, which is in every respect decidedly preferable.

Treatment.—Small-pox, like scarlatina and other diseases which result from a specific contagion, must run a certain course, and pass through its natural stages before the patient can be restored to health; hence we must not attempt to stifle the development of the symptoms or unnecessarily interfere with the natural progress of the disease, but should confine our treatment to palliative measures, and to preventing or counteracting any untoward accident which may occur during its course. The inflammatory disorders which sometimes arise during the progress of the disease should, on the contrary, be treated by remedies of a more active nature.

In the mild or distinct species of small-pox the inflammation of the skin is always comparatively slight, and that of the mucous membrane of the air-passages is seldom very severe; it should nevertheless be borne in mind that the eruption is not always developed in these structures in an equally mild form. In some instances, although mild and perfectly distinct externally, it may be accompanied with internal affections of a sufficiently serious nature to require the greatest attention and the most careful management. When, however, the eruptive fever is mild and the inflammation of the skin moderate, we have merely to keep the patient in bed in a cool, well-aired chamber, and watch the progress of the disease

TREATMENT OF SMALL-POX.

There is no specific for small-pox. Recently, *sidesaddle* (*sarracenia purpurea*) has attracted some attention in the treatment of this disease, but the profession are not satisfied that it is of any special service.

The great thing in the general treatment of small-pox is good nursing. In spite of all that we can do the disease will run its course. The same remark will apply to nearly all fevers.

During the progress of small-pox the patient may drink freely of lemonade, ice-water, and carbonated water—that is, water impregnated with carbonic acid gas—or of the effervescing draughts. (See *Effervescing Draughts.*)

The body should be frequently sponged with cool or tepid water.

The sickness at the stomach may be relieved by *oxalate of cerium* in doses of one or two grains, dry on the tongue; or by *subnitrate of bismuth* in doses of five grains.

When the patient becomes debilitated it is frequently necessary to use stimulants. Brandy, whiskey, and wine may be employed in such doses as the patient will bear.

If the patient is not much debilitated it may not be necessary to use any stimulants.

Pure air is important. The sick-room should be *freely ventilated* without *chilling the patient.* This same rule should be observed in the treatment of all fevers.

If the throat is very troublesome it may be gargled with salt and water, or with chlorate of potash and water—one drachm to an ounce of water.

If the eyes are exceedingly troublesome they may be treated as directed under diseases of the eye. (See *Eye*, *Diseases of.*)

During the progress of small-pox complications occasionally arise that require special treatment.

One of the most interesting points in the history of the treatment of small-pox is the various efforts which have been made from time to time to prevent the pustules from coming to maturity, and thus diminish the irritation and other unpleasant consequences that invariably accompany an extensive crop of confluent pustules over a large surface of the skin; for obvious reasons the greatest attention has been paid to the state of the face and neck. The Arabian physicians were in the habit of opening the pustules when completely formed, and pressing out the matter in order to prevent its absorption; the parts are then washed gently with a rag moistened in tepid milk; this practice may always be followed with advantage.

Some physicians endeavor to prevent the formation of pustules altogether by *cauterizing* them on the first or second day with the *nitrate of silver.* This may be done most safely by touching the pustule with a sharp-pointed stick of lunar caustic; the caustic should be applied lightly twice a day, so as not to burn the surface of the skin deeply; in this way the pustules are frequently prevented from coming to maturity.

Another method of treating the pustules is the application of collodion. (See *Collodion.*) This should be applied once or twice a day with a brush. This method is rather agreeable to the patient than otherwise.

Another method consists in covering the face, or such parts of the body as we wish to preserve from scars, with a mask of mild mercurial plaster. The plaster must be applied as soon as the pustules make their appearance, and be kept on for four or five days without intermission. This method is not attended with any danger, and may be safely entrusted in the hands of persons who have not received a medical education.

Persons laboring under confluent small-pox, especially towards the end of the disorder, require constant care and attention. When the whole body is covered with pustules which emit fetid pus in greater or less quantity, the surface should frequently be sprinkled with starch powder; the linen must be frequently changed, and every attention paid to cleanliness. Sores of an evil nature are about this time apt to form on the buttocks, or other parts of the body exposed to pressure; these sores must be carefully looked for, and undue pressure prevented by placing pillows under the back, legs, &c.; the sores may be dressed with a decoction of bark, and the patient's strength supported by wine, nourishing broths, and cordial draughts. The following is a good form:

Compound infusion of orange-peel, twelve ounces,
Aromatic confection, six scruples,
Sulphate of quinine, one scruple.

Two ounces to be taken every four hours.

SODA.

The carbonate of soda is sometimes used in preference to the carbonate of potash, in the preparation of effervescing draughts.

The dose is from fifteen grains to a drachm in water twice a day.

The *borate of soda*, or *borax*, is seldom used internally. A drachm of this salt, powdered and mixed with an ounce of clarified honey, forms a useful local application to the sore mouths of chil dren. The following mixture is very serviceable as a cooling gargle in common sore throat, and as a wash for the mouth where profuse salivation has been produced by the inordinate use of mercury.

Borax, in powder, two drachms,
Rose-water, eight ounces,
Tincture of myrrh, two drachms,
Honey, a teaspoonful. Mix.

(See *Sulphite of Soda.*)

SODA-WATER.

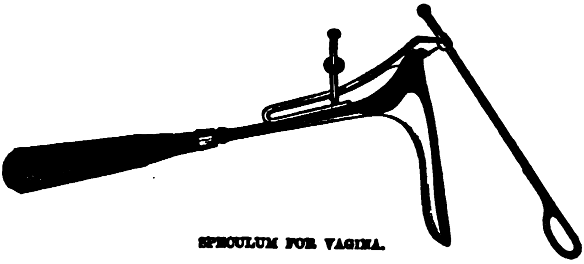
Soda-water, which is so popular in this country, is almost as harmless as it is agreeable. I think, however, that it would be better for our citizens to take more *acid* and less *sweet* drinks. Lemonade is on many accounts to be preferred as a summer drink to soda-water with rich syrups. There are comparatively few with whom lemonade will not agree.

SPECULA.

Specula are contrivances for examining the cavities of the body that are not directly open to the inspection of the eye. They are

EAR SPECULUM.

L. TIEMANN-CO.
SPECULUM FOR VAGINA.


SPECULUM FOR VAGINA.

of various shapes and composed of different substances, according to the part that they are designed to aid us in examining.

Specula for the ear separate the walls of the external auditory canal, and admit reflected light from a mirror against the drum of the ear, and enable us to study it with accuracy. (See *Otoscope.*)

Specula for the vagina separate the vaginal walls and bring into distinct view the neck of the womb, and reveal any disease that may exist there. Of these specula for the vagina there are a large variety. (See *Women, Diseases of.*)

These specula are not designed for domestic use, but their introduction into medical practice has revolutionized the treatment of the diseases of the parts and organs which they aid us to examine.

SPINE, DISEASES OF.

The word spine is a very indefinite word. It is applied to the *spinal cord*, to the *spinal column*, to the *nerves that issue* from the cord, and to the *muscles* of the back.

Pain in the back may come from one or all of these causes. It is an interesting fact that where there is serious organic disease, there is usually *very little pain in the back.*

Pain in the back is usually, though not always, the symptom and result of nervous exhaustion. Therefore dyspeptics, hypochondriacs, &c., frequently complain of uneasiness and distress in the small of the back. (See *Backache.*)

Pain in the back, from whatever cause it may arise, may be relieved by the following measures:

1. Plasters of belladonna, or of some other anodyne.
2. *Spongio-piline*, well moistened, applied directly over the aching part, and kept there by firm pressure of a band or bandage, or of the clothing. (See *Spongio-piline.*)

These backaches arise from nervous exhaustion and from diseases of the genital organs, and are only to be cured by curing the causes. Where we are unable to cure the causes we can at least *relieve* the distress and annoyance of backache by the measures that I have recommended.

When the pain in the back, from any cause, is exceedingly severe, it may be necessary to resort to hypodermic injections of morphine or atropine. (See *Hypodermic Injections.*)

When we have reason to suspect the existence or approach of real organic disease of the bones of the spine, we should consult some reliable surgeon, accept his opinion, and obey his advice.

Parents should watch their children when they think that they see evidence of spinal disease, and have them taken in time.

There are many cripples in the land who might have been well to-day if their parents had early acted upon the suggestion here offered.

CURVATURES OF THE SPINE.

The spine curves from a variety of causes. *Disease of the bones* may produce curvature. Weakness of the muscles of the back may also bring on the same result. There are three kinds of curvature—*backward*, *forward*, and *lateral.*

Of late years great improvements have been made in the treatment of spinal curvatures by means of mechanical appliances.

There is no reason why parents should necessarily be discouraged when they find out the unwelcome fact that a child has a curved spine. Even if the curvature results from disease of the bones (the so-called *Pott's disease*), it may be entirely or approximately cured.

The mechanical appliances that are used must be adapted to each case. To give any rules or special suggestions for the use of these appliances would be impossible.

PREVENTION OF DISEASES OF THE SPINE.

Every one can do something towards preventing diseases of the spine, even if they can do but little to cure them after they are fully upon us.

We can prevent these diseases by obedience to the laws of health; by allowing our children plenty of air, sunlight, good food; by giving them comfortable chairs in our schools and homes; and by taking in time all the beginnings of evil.

DISEASES OF THE SPINAL CORD.

Congestions, inflammations, and other affections of the spinal cord, like all other diseases of the nervous system, are increasing in frequency.

Both the brain and the spinal cord are very much at fault in a large number of the chronic diseases of our time.

From Dr. Chas. F. Taylor's suggestive treatise on the diagnosis of diseases of the spine I quote the following passage:

" The peculiarity in the patient's attitude is unmistakable. He does not always lean to one side or the other, though frequently doing so; but there is an expression intimated and easily detected;

an effort to get as many springs under him as possible; a letting down of each joint of the body, so as to avoid shock. This is instinctive, and the patient is unconscious of it. He takes a peculiar crouched position, and sometimes is disinclined to sit at all; for in sitting he would be folded together, and the pressure upon the bodies of the vertebræ would be increased. When the child comes to his mother's lap he will fall heavily upon it, and wish to bear his whole weight upon his elbows. These symptoms are more noticeable in the severer cases, which will serve as types by which to judge of slighter indications of the same character.

"I have often alluded to the fact that in Pott's disease there never is sensitiveness along the spinal column. Out of three hundred and eighty-two record cases, attended during the last three years, I have never found one case with spinal hyperæsthesia.

"Feeling along the back for tenderness must therefore be abandoned, as a means of diagnosis in these cases. Percussion over the supposed seat of the disease is equally worthless as a means of diagnosis. Too many cases are allowed to run on until past cure, by trusting to a symptom which does not exist.

"Another symptom which may occur in the first stages of Pott's disease, is paralysis. It may appear very early, even before any deformity can be noticed. It is not difficult to distinguish this form of paralysis from that due to other causes. In such a case we fall back at once upon the rational symptoms. Inquire into the state of the child's health for the last six or eight months, and we generally find that he suffered some injury a few weeks before the date of the earliest symptoms, which will always resemble more or less closely those previously described. Paralysis arising from spinal disease in the early stages is apt to be brief. The child is put to bed, gets rest, and his paralysis passes off in a few days. The paralysis is apt to be more protracted, lasting one or two years, when occurring in the later stages of the disease.

"If you find a child with some dragging of the foot in walking, it should at once call your attention to the spine; and generally when the attention is once directed there, if the paralysis is caused by disease of the vertebræ, it will be possible to discover some slight deviation in the contour of the back. There will probably be no decided projection, but only a slight deviation from the normal curve—the lumbar vertebræ being perhaps less curved forward, or the dorsa. more curved backward than normal."

Dr. H. G. Davis says of the relation of the general health tc spinal curvature:

"The general health begins to fail gradually, and the effort tc maintain the erect position during walking and sitting becomes more tiresome; derangement of the stomach is apt to supervene, with constipation of the bowels. Pains occur in the side and back. In the female, dysmenorrhœa is often present, and the countenance is pale, careworn, and exhibits a chlorotic appearance.

"In many slight cases of lateral curvature, the health suffers little or nothing; the local symptoms may be principally those of which the patient complains—as pain in the right shoulder, fatigue on making slight exertion, interference with the respiration; after a while, as the distortion increases, with altered size of the thorax; palpitation of the heart from the same cause, as well as from its mechanical displacement and compression; disorders of the digestive and other organs, both primarily produced by the deformity, and secondarily through failure of the general health and strength.

"One symptom may be particularly mentioned, namely, a constant pain in the left side in cases which have progressed, the pain, which is difficult to relieve, being referred to the left side, just below the ribs."

SPRAINS.

When a joint is twisted or strained in a direction contrary to its natural range of motion, or is moved to too great an extent in a natural direction, the injury done to the part is called a sprain. In all cases, the ligaments and tendons are stretched, and the soft parts about the joint are more or less injured. The pain which immediately follows the accident is always very acute, and greatly increased by the slightest motion of the joint; sometimes it is accompanied by sickness at stomach, and faintness. The parts soon become swollen, and in many cases there is considerable discoloration occasioned by the bursting of numerous small vessels, and the consequent effusion of blood into the cellular or fatty substance beneath the skin. In severe cases, the ligaments are partially torn, and the muscles of the limb are injured. Sprains are always very troublesome injuries; and often, especially in elderly persons, require a longer time before the cure is completed than a broken bone or a dislocation. In persons of scrofulous constitutions, a sprain freqnently becomes a very serious and tedious disorder, and, when neglected or improperly treated, sometimes give rise to the disease of the joints called white swelling. The parts most liable to this accident are the ankles, wrists, and joints of the thumbs and fingers; the ankle is most frequently affected, particularly at the outside of the joint. A fall, making a false step as it is usually called, and leaping, are the ordinary causes.

A sprain at the wrist, or at the thumb or fingers, commonly arises from falling upon the hand.

Treatment.—The *first* object in the treatment of sprains is to prevent or subdue inflammation; and for this purpose the most essential of the measures to be adopted consists in keeping the joint perfectly at rest, the limb being elevated higher than the rest of the body, in order to diminish the flow of blood to the part. When the ankle is sprained, the limb should be placed upon a pillow covered with a piece of glazed cloth; and the parts are then to be kept constantly wet with any simple cold lotion, as *Goulard water*, or vinegar and water. But cold applications are not to be employed if the patient be troubled with cough, or disposed to inflammatory disorders of the lungs; and females are, no doubt, aware that they would be improper during menstruation. Many surgeons, instead of applying cold lotions to sprained or bruised parts, prefer the practice of fomenting them with warm water, or *decoction of poppy-heads*. On this point the patient must judge for himself. If cold applications do not produce the effect of soothing the pain and abating the inflammation, it will then be proper to have recourse to warm emollient fomentations.

In severe cases it may be necessary to apply twelve or fifteen leeches round the joint, and afterwards warm emollient fomentations and poultices; cooling saline purgatives are to be taken, and the patient ought to confine himself to low diet until the inflammatory action is entirely subdued.

The *second* object is to restore the proper tone of the vessels, and to brace the weakened parts, in order to allow the joint to perform its natural functions. But no measures are to be had recourse to with this purpose, until we have succeeded, by keeping the joint perfectly quiet, and by the means above directed, in subduing the inflammation. It will then be necessary to *pump cold water on the joint*, and employ friction with *opodeldoc*, or some other stimulating application. The treatment is to be conducted on the same principle as that of bruises. There is no better method of keeping down the swelling, of supporting the parts, and restoring their tone, than pressure by means of a laced stocking, or the application of a flannel roller. Some practitioners apply strips of adhesive plaster in opposite directions round the joint, and this, when properly managed, is perhaps the best plan of employing pressure.

We repeat, that the most essential part of the treatment consists in *keeping the joint at rest*. Without attention to this, no remedies are likely to be of much service. Recovery is often retarded by premature attempts at using the limb; by this imprudence the inflammation in many instances is renewed, and becomes chronic, the bones at the joint become diseased, and amputation is the consequence. One of the best methods of treating sprains is by electrization. (See *General Electrization* and *Localized Electrization.*) This treatment may be used at almost any stage of the injury. In my hands it has frequently been very efficacious indeed.

SPANISH, OR BLISTERING FLIES.

Spanish flies, or cantharides, are a species of beetles common in Spain, Sicily, Italy, and some other parts of Europe. They are found adhering to the leaves of the ash, the lilac, willow, and other plants, and are collected before sunrise in the months of June and July; they are killed by being exposed to the vapors of vinegar, and are afterwards dried in a stove.

These insects are employed for medical purposes both internally and externally, but are chiefly used to make the common *blistering plaster.* When the immediate effect of a blister is required the *vinegar of cantharides* is the most effectual application. A piece of blotting-paper moistened with this fluid raises a blister almost immediately; hence it may prove of essential service when applied behind the ears in toothache, or over the stomach in cases of sudden cramp; and the raw surface produced in this manner affords a ready means of introducing certain medicinal substances into the system by absorption. Morphine, for example, when sprinkled upon a portion of the skin which has been deprived of its cuticle, is quickly absorbed, and the patient may be thus relieved where remedies could not be otherwise employed, as in cholera, colic, &c.

Cantharides are sometimes employed internally in cases of palsy of the bladder, whites, gleets, &c., and are administered either in *tincture* or in *powder*, the dose of the former being from ten to thirty drops, that of the latter from one to three grains. In full doses they act powerfully on the urinary and generative organs, and if taken incautiously may produce strangury, bloody urine, vomiting, and inflammation of the bladder, kidneys, or intestines.

Cantharides are sometimes absorbed into the system from a blister, and cause great heat, pain, and difficulty in making water. When this accident occurs the patient should drink freely of barley-water, linseed tea, or any other demulcent drink; and take four ounces of *camphorated emulsion*, with twenty drops of *laudanum* or half a drachm of the *tincture of henbane*, to each dose.

SPHYGMOGRAPH.

This is a contrivance for recording the character of the *pulse.*

It is of material assistance in the study of the pulse in various morbid conditions. It is a somewhat complicated apparatus, and has not yet come into general use in the profession.

A general idea of this apparatus may be derived from the cut.

FIGURE 2.—THE SPHYGMOGRAPH.

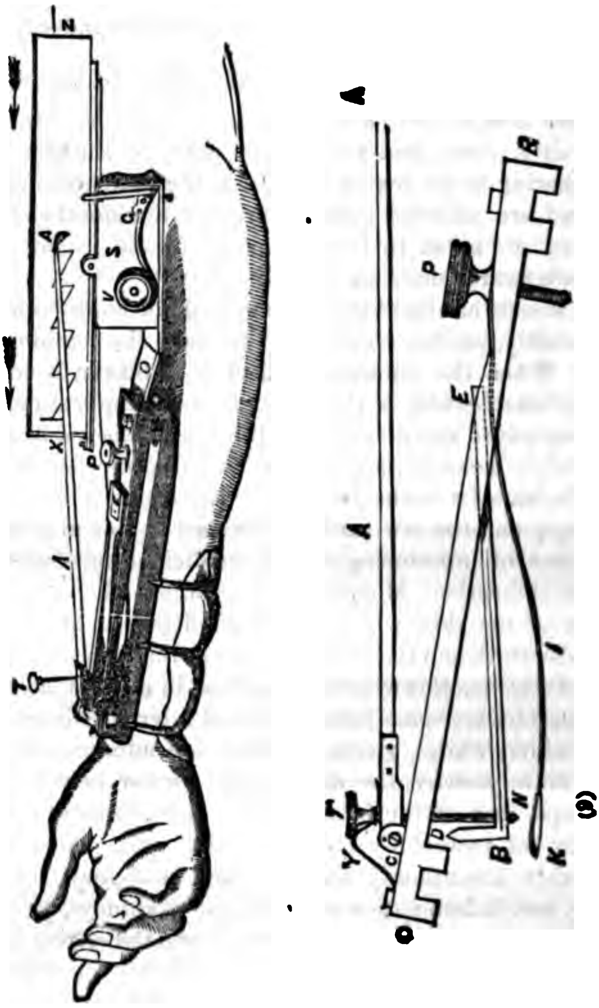


FIGURE 1.—The Sphygmograph applied to the Fore-arm.

FIGURE 2.—Enlarged view of the frame of the Sphygmograph in profile, showing the arrangement of the levers.

A A′ a, the writing lever, the axis of which is at C; K, the spring; B, the lever by which the movements of K are transmitted to A; D, its knife edge; T, an adjusting screw for varying the distance between K and D according to the pressure required; P, an adjusting screw for permanently adjusting the spring at the proper obliquity; F, G, the box in which the clockwork is contained; L, M, the traveller.

N. B.—The same letters are used in both figures.

It represents the sphygmograph applied to the fore-arm. It is kept in its position by a bandage passed round the wrist. The plate rests on the artery. Each pulsation of the artery slightly moves the plate, and a clockwork attachment moves a frame from M towards L, at the rate of three inches to a tenth of a minute. At the end of the lever *a* is a pen of a peculiar shape, which writes on a piece of glazed paper as the frame moves.

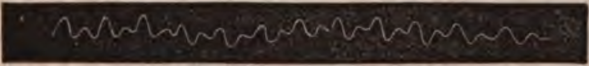
A similar clockwork attachment is connected with the dynamometer. (See *Dynamometer.*)

That the pulse varies in disease and in health with the nature of the constitution and the condition of the system, everybody knows. The advantage of this apparatus is, that it *definitely records the character of the pulse.*

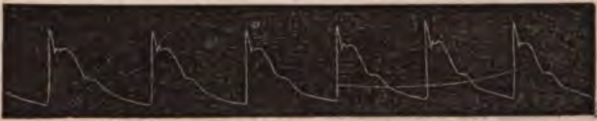
The accompanying cuts represent the firm and long pulse of vigorous health, and the hard pulse of chronic Bright's disease.

Inflammations of the heart, enlargement of the heart, typhus fever and irritative fever, all have their characteristic pulse, that may be distinctly recorded by this ingenious contrivance.

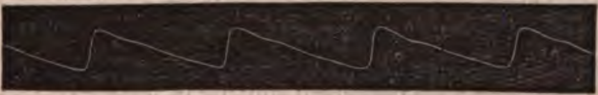
PLATE I. SOFT PULSES.



Undulatory pulse of typhus.
(Frequency, 160.)



Hard pulse of chronic Bright's disease (contracted kidney).
(Frequency, 70.)



The firm and long pulse of vigorous health.
(Frequency, 50.)

SPITTING OF BLOOD, OR HEMORRHAGE FROM THE LUNGS.

This disorder may come on suddenly, when the patient least expects it; but in general it is preceded by symptoms of congestion of the lungs. A sensation of tightness, heat, and itching is felt throughout the chest, or at some particular part of it, accompanied with difficulty of breathing and a feeling of anxiety. The pulse may be felt jerking or vibrating under the finger; the patient experiences frequent chills, alternating with flushes of heat; his extremities are cold, and he feels languid. When the blood has escaped from the vessels, and is thrown loose into the air-passages, a sense of ebullition or bubbling is felt in the chest, arising from the air coming in contact with the blood during the alternate movements of inspiration and expiration; at the same time there is often a saltish taste in the mouth, and the difficulty of breathing is increased. At length the irritation in the air-passages produces cough, which is followed by expectoration of a greater or less quantity of blood. Sometimes the titillation excited in the windpipe and throat causes the contents of the stomach to be thrown up, and, as these are mingled with blood, we might at first suppose that the hemorrhage has proceeded from the stomach. But in most cases the red vermilion color and frothy appearance of the blood, and the previous symptoms of internal disease, are sufficient indications that the lungs are the source of the hemorrhage. The extent of the discharge varies greatly. Many cases are on record where persons have ejected considerable quantities of blood from the lungs, periodically, for years, and yet have ultimately recovered; but in persons of a scrofulous or tuberculous constitution the slightest expectoration of blood is a symptom of fearful omen.

Women are more subject to spitting of blood than men, owing in a great measure to the facility with which the menstrual flux is obstructed from various causes. When that important function is suppressed, or ceases to be performed, the superabundant blood sometimes seeks its way out of the body through other channels; occasionally it escapes from the blood-vessels of the lungs into the air-passages, and is coughed up without causing pain or much inconvenience. This may continue periodically for a considerable length of time, perhaps for years; and at last ceases when the natural function of the womb is restored. Many women, otherwise in good health, are affected with periodical spitting of blood every time they become pregnant; but in all cases of this description the discharge, even when profuse, is not to be viewed in so serious a light as when it occurs under other circumstances. Another fruitful source of this disorder in girls is the bad habit of wearing tight stays. When the chest is strongly girt with stays the natural movements of respiration are impeded, and the blood is retarded in its passage through the lungs; the obstruction thus produced acts in the same manner as malformation of the chest, organic diseases of the heart, or any other circumstances, which, by mechanically interrupting the balance of the circulation, may cause the blood to stagnate in the lungs until, as not unfrequently happens, it is forced out of the vessels into the bronchial tubes or air-passages, and discharged by the mouth. Spitting of blood is not the only evil which this artificial system of restraint induces: the free expansion of the lungs being impeded, the breathing is rendered shorter and quicker than natural, and the air not being admitted in due quantity, the blood is not sufficiently oxygenized, and the whole organization of the body suffers in consequence. The healthy temperature cannot be kept up, the countenance is pale, the feet are often cold, and there is a degree of listlessness and depression which unfits the body for the requisite exercise of its physical powers. This imperfectly vitalized state of the blood prevents the process of nutrition from being adequately accomplished; hence every part of the animal economy is reduced below the standard of healthful vigor, and if any dormant predisposition to consumption be present, nothing will more certainly rouse it into action than this depressed condition of the vital powers,—a condition which but too frequently brings on this fatal malady where no hereditary disposition exists, and in all cases increases the susceptibility to the impression of other diseases.

The exciting causes of this disorder are numerous. It may arise from any violent bodily exertion, as running, rowing, or wrestling; from sudden changes of temper, or from sudden exposure to cold when the body is overheated; and it may be brought on by any circumstances which debilitate the body or render the circulation irregular. Fatal hemorrhage from the lungs has occurred in some instances from distress of mind.

All blood that comes from the mouth does not necessarily come from the lungs. It may come from the *throat*, the *windpipe*, the *bronchial tubes*, the *mouth*, or the *stomach.*

Bleeding from the mouth occurs in *scurvy*, from ulceration or weakness of the gums, or from extraction of teeth. When it proceeds from *scurvy* it should be treated by mild *astringent washes of tannin, or alum* (*five grains to one ounce of water.*) When it follows the removal of a tooth the cavity may be plugged by lint or cotton dipped in Monsel's salt. (See *Monsel's Salt*, or *Creasote*, or *Carbolic Acid.*)

The great point is to distinguish between the blood that comes from the lungs and that which comes from the stomach.

The differences are these:—

FROM THE LUNGS.	FROM THE STOMACH.
Blood *coughed* up, red and frothy, and mixed with spittle.	Blood *vomited*, dark color and not frothy, and mixed with food.
Difficulty of breathing.	Sickness at the stomach.

Bleeding from the throat and windpipe is not usually of a serious character.

TREATMENT OF SPITTING OF BLOOD FROM THE LUNGS.

1. *Absolute rest* in a horizontal position.

Rest is the principal thing, and should be chiefly insisted on. The friends of patients are frequently more alarmed than is necessary, and desire to pour down a large quantity of medicine. In many cases no medicine at all is needed.

2. *Common salt*, in doses of one or two teaspoonfuls dissolved in water. This is a popular remedy, and is very serviceable.

Ice and alum may be held in the mouth and slowly swallowed.

The *tincture of the chloride of iron* may, in bad cases, be given in doses of *ten or fifteen* drops in water. Usually, however, *rest, common salt*, *ice*, *and alum* are all that are necessary.

The diet should be mild and unirritating.

These are the means to be adopted during the attack; the subsequent treatment must depend on the nature of the disease which has given rise to the hemorrhage, for, as has been already mentioned, this affection is much more frequently symptomatic of disease of the lungs, heart, &c., than a disease in itself.

We mentioned at the commencement of this short essay that spitting of blood may arise from obstruction of the menses, and that when we succeed in restoring this important function the hemorrhage from the lungs does not recur. It must, however, be kept in recollection that spitting of blood rarely occurs from this cause, although for the most part it attacks young women whose menses have been for some time obstructed; and it has been well ascertained that under such circumstances both these affections, in the great majority of cases, result from tubercles in the lungs, as we have had already occasion to notice in another part of this volume. (See *Pulmonary Consumption.*) It is therefore preferable to wait until the advice of a physician can be obtained, rather than to administer stimulating remedies with the intention of bringing back the menstrual discharge. In certain cases severe hemorrhage from the lungs occurs in females at the turn of life, when the menstrual discharge is about to cease altogether. The symptoms of this form are often very alarming, but the loss of blood is usually restrained by an assiduous use of the means just pointed out.

SPONGIO-PILINE.

This is a combination of *sponge*, rubber, and wool, that has recently come into use, and has been found very serviceable as a kind of extemporaneous poultice, and also a substitute for the "compress" of the water cure. It is made of rubber, lined with sponge and wool to the thickness of about a quarter of an inch. It comes in large rolls, and is sold by the square inch or square foot. If it were not so expensive it would be much more used than it is now.

In order to use this spongio-piline for a poultice, simply wet it with warm or cold water, as may be desired, or with some medicated solution, and apply it directly to the parts, the sponge lining being inside. The rubber covering acts like oiled silk, and retains the moisture. When much used, the spongio-piline will need to be frequently washed. The spongio-piline may be applied in the same way to the pit of the stomach in dyspepsia, over the bowels, over the ovaries, to sprained joints, in rheumatism, and so forth. It keeps up a mild and pleasant counter-irritation.

SPOTTED FEVER, OR CEREBRO-SPINAL FEVER.

This disease has only recently become known. It was heard of in Europe in the 13th and 14th centuries. It appeared in the United States in 1806. Since 1848, several epidemics of it have occurred in various parts of the country.

It is a dreadful disease. *The majority of the cases die*, and usually within three days.

The attacks usually come on suddenly. The symptoms are *severe pain in the head*, *chills*, *nausea*, *vomiting*. Then comes delirium, perhaps convulsions, sometimes deafness or blindness. Stupor may occur, or exceeding sensitiveness over the body.

The pulse at first is slow, but is afterwards more rapid.

Spots occur in the majority of cases on the neck, breast, and limbs, rarely on the face. These spots vary in size. Some of them are three-fourths of an inch in diameter. They do not disappear on pressure.

In glancing over these symptoms it will be seen that many of them are similar to those which announce many other fevers. It is therefore impossible to tell at first what kind of a fever the patient is to have. *Any one who is taken down with these general symptoms of fever should secure at once the best possible medical advice.* If they are so situated that they cannot obtain medical assistance, all that they can do is to treat themselves, or allow their friends to treat them, on general principles, and without making any attempt to find out at once what kind of fever is coming on, or what its name may be.

These remarks have a general application, and do not alone concern spotted fever. If there is an epidemic about us of small-pox, or spotted fever, or typhus fever, then, of course, we have reason to suspect that the fever that attacks us is the one which prevails.

TREATMENT OF SPOTTED FEVER.

No treatment seems to be of much service. The profession are yet in the dark on the subject. We may give quinine, and brandy, and opium, and whiskey; we may rub the body with hot cloths; we may apply blisters and dry cups; and after all the patient will probably die.

After death there is usually found more or less change in the *brain* and *spinal cord.* Therefore the disease is sometimes called *cerebro-spinal fever.*

SQUILL.

Squill is principally employed as a diuretic and expectorant.

The dried root of squill is often of great service as a diuretic in dropsy, in the dose of a grain evening and morning, gradually increased to three grains; its power is augmented by combining it with small doses of calomel or blue pill. This combination is more particularly useful when dropsy is connected with obstruction of the liver or spleen.

The *tincture* and *oxymel* of squills are frequently prescribed to promote expectoration in chronic cough, asthma, hooping-cough, and difficulty of breathing occasioned by the lungs being oppressed with tenacious phlegm. The stimulating property of squill renders its use improper in all cases connected with inflammation. The dose of the tincture of squills is from ten to twenty drops three times a day, and of the oxymel half a drachm may be given three or four times a day.

STAMMERING AND STUTTERING.

According to Hunt, "Stammering is characterized by an inability or difficulty of properly ennunciating some or many of the elementary speech sounds, either when they occur at the beginning or the middle of a word, accompanied or not, as the case may be, by a slow, hesitating, more or less indistinct delivery, but *unattended with frequent repetitions* of the initial sounds, and consequent convulsive efforts to surmount the difficulty.

"Stuttering, on the other hand, is a vicious utterance, manifested by *frequent* repetitions of initial or other elementary sounds, and always more or less attended with muscular contortions."

The *causes* of stammering and stuttering are various. It may be caused by *cleft-palate*, *hare-lip*, *elongated uvula*, *enlarged tonsils*, *diseases of the tongue and bad position of the teeth*, *disease of the brain and spinal cord.*

It may be what is called a purely nervous affection, not connected with any organic condition whatever. It may result from nervous exhaustion. Poisons in the blood, loss of blood, stimulants and narcotics, old age, imperfect development, deficiency of brain, and consequent lack of will, all may be the causes of this disease.

TREATMENT OF STAMMERING.

Each case should be treated by itself by some one who thoroughly understands the art. The treatment consists mainly in *training the patient to control his speech* by appropriate discipline.

Mr. Hunt says that on the average it takes at least twenty weeks to perform a cure. He believes that under practice and persevering treatment the disease is much more relievable than is commonly believed. Relapses sometimes occur.

Some cases may be cured in a very short time.

Stammering seems to be analogous to *St. Vitus's dance*, *writer's cramp.* Its nature is mysterious, and its cure, though a matter of difficulty, is frequently possible.

On the statistics of stammering, Hunt has the following interesting remarks:

"Colombat assumed that there were in France about 6,000 persons laboring under defective articulation, or nearly 1 in 5,000. There can be no doubt that the actual proportion is much greater. Colombat himself admits that he included in his estimation such only whose impediments were strongly marked. In Prussia, which in 1830 contained a population of about 13,000,000, the number ascertained from official returns of many places, was calculated to amount to more than 26,000 cases for the whole kingdom. According to this calculation, taking the population of the globe to amount to about 1,000,000,000, the number of stutterers and stammerers would form an army of 2,000,000, of which London alone would possess nearly 6,000. It would be very desirable if the Registrar-General would employ the means at his disposal to ascertain the actual number of persons laboring under various impediments of speech in Great Britain, which, I have little doubt, would be found to approach the proportion of 3 in 1,000. It is unquestionable that impediments of speech are far less frequent in females than in men. Itard declares he never met with a female stutterer, although he does not deny that such exist. According to Colombat, one woman only in 20,000 stutter; while the proportion according to the *same authority in men is one in* 5,000.

STARVATION.

Starvation is very properly included among the diseases. Among the poorer classes the disease is much more frequent than may be readily believed. Starvation is not necessarily a speedy process. It may be exceedingly gradual. *The quantity of nutriment received by the system may be constantly less than it should be, and yet sufficient to sustain life* "*at a poor dying rate*" *for years.* There is no question that among the poorer classes especially, thousands of children and even adults are slowly starved to death every year. The same is true even of many who have abundant means. Erroneous ideas on hygiene have induced many to slowly starve themselves by a rigid diet. The horrible teachings of Alcott, Graham, and President Hitchcock have injured many of the best minds of the land.

Starvation may also result from cancer of the stomach, that renders it impossible to digest food.

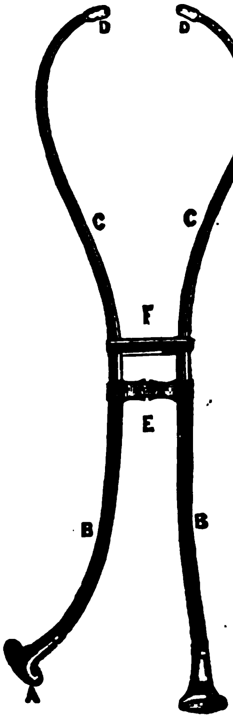
Among the symptoms of starvation are an irresistible tendency to fall asleep, feeble circulation, a constant feeling of languor, difficulty of breathing, palpitation of the heart, emaciation, and a downcast, wearied cast of countenance.

Starvation may bring on other diseases. It may bring on typhoid fever, rickets, scrofula, consumption, scurvy.

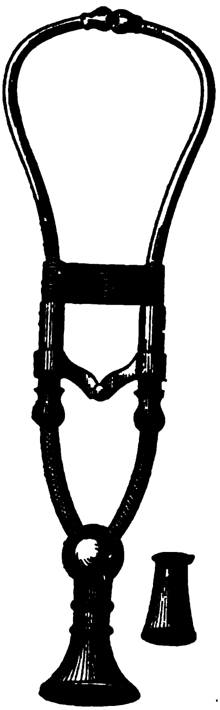
Starvation is to be treated by *nourishing food, tonics, and stimulants.* After prolonged abstinence the food should be of a mild and easily digested character, and should be given very gradually and in very small quantities. It may be necessary in some cases to inject beef-tea into the rectum, instead of giving it by the mouth. Stimulants and tonics should also be given at first with great caution.

"The effects of continued insufficient alimentation have been graphically described by De Meersman, as observed in Belgium during the famine years of 1846–47 (quoted by Longet in his 'Traité de Physiologie,' t. i.). The extreme emaciation of the body, pallid face, and sunken cheeks; the bright eye and dilated pupil; haggard, bewildered look; the weak, tremulous voice, the feeble memory, infirm mind; the slow, uncertain, tottering gait; dry, yellow, parchment-like, and fetid skin; stinking breath; shrunken belly; slow, sighing respiration; small, frequent, and gaseous pulse, are all described with sickening fidelity. But the largest field for the observation of the consequences of gradual continuous starvation was afforded by the Andersonville military prison towards the end of the late war, where thirty thousand men were exposed, within an area of twenty-seven acres, without shelter, and with food insufficient in quantity and quality, to the weather, with all the ills of overcrowding, and were literally, slowly, and surely starved to death. The report of Professor Joseph Jones, of Nashville, Tenn., made to the Surgeon-General of the Confederate army, on the condition of the prisoners of war, has been well called 'the most complete scientific history of inanition ever written, deduced from data which are, and probably always will be, unparalleled in magnitude.' This, in a medical point of view, invaluable and instructive report is published at length in the 'Medical Memoirs of the U. S. Sanitary Commission.'"

STETHOSCOPE.



ALLISON'S DIFFERENTIAL STETHOSCOPE.



CAMMANN'S STETHOSCOPE.

Stethoscopes are tubes of various shapes, employed in sounding the chest. (See *Auscultation.*) The physician presses one end of the stethoscope firmly over that part of the chest which he wishes to examine, and applies his ear to the other end. Many physicians use no stethoscope at all, but apply the ear directly against the walls of the chest.

STOMACH, INFLAMMATION OF.

Acute inflammation of the stomach is a rare disease. When severe it is characterized by symptoms which distinguish it from other disorders. After the usual premonitory symptoms of all acute inflammatory affections, such as pain of the limbs and loins, slight giddiness, lassitude, general uneasiness, and a fit of shivering or chills alternating with flushes of heat, the patient is attacked with burning pain at the pit of the stomach, nausea, retching, great anxiety, and extreme restlessness. There is an urgent and constant desire for cold drinks, which for the most part are no sooner swallowed than they are thrown up again, mixed with portions of mucus or bile. The region of the stomach generally feels unusually hot, and the slightest pressure upon it greatly augments the pain. The pulse is quick and small, sometimes soft, but more frequently hard; the tongue, at the commencement of the disease, may be white and furred, or it may present no particular appearance, but in general it soon becomes rough in the centre and towards the root, while its edges and point are red. In bad cases the pain extends upwards along the gullet and across the abdomen, attended with a great sense of tightness, and shooting pains are felt extending to the back between the shoulders; the breathing is quick, hiccup is a more or less troublesome symptom, and the countenance is expressive of anxiety and extreme suffering. If the disease continues to gain ground, the thirst becomes unquenchable; and although the patient is well aware that whatever he takes into the stomach will be almost immediately vomited up with great pain, yet so urgent is the thirst, that he is unable to resist the craving for cold drink with which he is unceasingly tormented; the breathing becomes quick and laborious; the patient lies on his back, and perhaps faints when any attempt is made to raise him up in bed; the pulse is now small, feeble, and intermitting; cold sweats break out all over the body, the extremities are cold, the features are shrunk, and for some time before death there is great prostration of strength.

When inflammation of the stomach gives rise to the alarming train of symptoms above enumerated, we have always reason to suspect that some acrid or corrosive substance has been swallowed, such as arsenic, cantharides, or corrosive sublimate; because we know that this violent form of the disorder seldom occurs independently of the operation of irritating poisons. If, therefore, the vomiting and other symptoms already noticed, which announce the disease, can be traced to this cause, no time should be lost in removing the poison from the stomach. This is most effectually done with the stomach-pump; by means of this instrument the surgeon fills the stomach with warm water, then pumps it out, introduces more water, removes it in the same way, and continues in this manner to fill and empty the stomach until the fluid comes away quite clear. But if medical aid cannot be obtained, an emetic of from twenty-five to thirty grains of the *sulphate of zinc* (*white vitriol*), or ten grains of the *sulphate of copper* (*blue vitriol*), dissolved in a wine-glassful of water, should be administered as soon as possible. These emetics are to be preferred, because they act more promptly than ipecacuan or tartar-emetic. After the poison has been removed, whether by means of the stomach-pump or an emetic, the ordinary remedies for inflammation of the stomach are to be employed according to the urgency of the symptoms.

The occasional causes of inflammation of the stomach are excess in *eating and drinking*, *bad liquors*, indulging in the use of highly seasoned food, blows inflicted over the stomach, drinking cold water or using ices when the body is overheated from exercise, exposure to cold and damp, or any of the ordinary occurrences which produce inflammation in other organs or parts. In children it occurs most frequently during the process of dentition, and it often arises during the course of fevers and other inflammatory disorders of warm climates.

All the treatment that is necessary is rest, abstinence from food, ice melted in the mouth, and a very small dose of magnesia. The patient generally recovers in three or four days.

CHRONIC INFLAMMATION OF STOMACH.

The symptoms of this affection closely resemble those of dyspepsia. (See *Dyspepsia.*)

It is impossible in many cases to distinguish between the two diseases: they are, indeed, essentially one. Dyspepsia is a symptom of chronic inflammation of the stomach. All the symptoms of dyspepsia may exist, however, without any inflammation of the stomach. Dyspepsia is usually and chiefly a nervous affection, particularly among the brain-working and luxurious classes. Among barbarous people, and ignorant degraded classes, it is more frequently a symptom of chronic inflammation of the stomach, caused by *gluttony or some error of diet.*

ULCER OF THE STOMACH.

This is found most frequently in persons of delicate constitution. The symptoms are the general symptoms of dyspepsia, together with *vomiting of blood, localized* pain in the stomach.

CANCER OF THE STOMACH.

This is indicated by some of the same symptoms as ulcer of the stomach. (See *Cancer of the Stomach.*)

The treatment of ulcer of the stomach and cancer of the stomach is substantially the same. Both are severe and fatal diseases. (See *Cancer of the Stomach.*)

STONE AND GRAVEL.

Stone and gravel are the terms applied to concretions formed in the kidneys and bladder, by a morbid deposition from the urine. This fluid, when in a healthy state, contains in solution at least twelve different ingredients; of these, some belong to the class of acids, others are alkaline or earthy substances. Now, in certain morbid conditions of the system, the urine undergoes changes within the body; and some of these ingredients accumulate until they are no longer held in solution, but are deposited in a solid form in the kidneys or bladder. The salts which form the deposition are chiefly of two classes, depending on two distinct states of the constitution, with which they are respectively associated. In the *first class*, which is by far the most common, the lithic or uric acid, and lithates, more especially the lithate of ammonia, form the deposit which is called, in popular language, *red gravel*, whether it appear in the form of sand or distinct concretions. In the *second class*, the deposition consists of the phosphatic salts; namely, the ammonio-magnesian and the phosphate of lime, generally the latter. This species of the disorder is known under the denomination of *white gravel.*

The passing of red sand or gravel is preceded, during a considerable length of time, by a copious deposition from the urine of a tawny, reddish-brown, or brick-dust color, or of a more or less vivid pink hue. The urine from which this sediment is precipitated, when first voided, is generally clear, rather scanty, and high colored. It is most frequently met with in children, and in persons beyond forty years of age.

All authors who have written on this subject have noticed the intimate connection which exists between gravel and gout; both diseases, in numerous instances, appear to derive their origin from the same source. The peculiar condition of constitution, whether derived from hereditary origin, or acquired by luxurious living, which is considered essential to the production of gout, is acknowledged on all hands to be of the same nature as that which is associated with gravel. Sudden and frequent alternations of temperature, long exposure to cold and wet, and similar circumstances, are classed as predisposing causes of considerable influence; and this appears probable, from the fact that gravel complaints are more common in temperate than in very cold or warm climates; indeed, in the latter these disorders are scarcely known, probably owing to the free perspiration which is kept up by the constant heat. It has been well ascertained that the red gravel occurs most frequently in persons whose skin is habitually harsh and dry; in fact, a free and regular action of the skin seems almost incompatible with the occurrence of this form of the disorder. (*For method of relieving an attack or fit of gravel, see Kidney, Diseases of.*)

The medical treatment consists in the use of alkaline remedies, for the purpose of correcting the morbidly acid state of the stomach and of the urine. The medicines of this class usually employed are soda, potash, and magnesia; these are administered either to prevent the formation of red gravel, where the state of the urine above described exists, or to palliate the symptoms where the disorder has already commenced. From half a drachm to a drachm of *bicarbonate* (commonly called carbonate) of *soda* or of *potash*, dissolved in from half a pint to a pint or more of barley-water, toast-water, rice-water, linseed tea, decoction of quince-seed, or any other mild diluent, should be taken twice or thrice a day, according to circumstances, about two or three hours before or after eating, and continued daily for a considerable length of time. These alkaline salts may, in most cases, be taken for many months without deranging the digestive organs, and with much benefit to the patient's general health. If, however, the stomach become weakened from their long-continued use, it will then be advisable to take them along with an *infusion of camomile flowers*, or dissolved in a *decoction of gentian* or of *calumbo*. The manner of preparing and using these tonic remedies has been already pointed out in other parts of this volume. ***Magnesia***, in doses of ten grains once or twice a day, has sometimes been found more serviceable than the carbonate of potash or of soda. Equal parts of *lime-water* and *rennet whey* constitute one of the best remedies that can be employed in this species of gravel. Every alkaline medicine, when taken for a long time, is apt in many cases to disagree with the stomach; it is therefore, in general, advisable to vary these remedies, rather than to persist long in the use of *any one* of them in particular. In making out the two kinds of gravel the microscope is of great service. (See *Microscope.*)

The *second* kind of gravelly disorders, in which the urine deposits the phosphatic salts in the form of white sediment or sand, generally depends on some constitutional derangement of a serious character, or on great irritation or organic disease of the urinary organs. In the first, or lithic-acid gravel, the urine is generally more or less scanty, high-colored, and deposits a red sediment; here, on the contrary, it is of a pale color, secreted abundantly, and deposits, when cool, a copious white sediment, sometimes white sand. This species of gravel is also frequently met with among the ill-fed and half-clothed children of sickly or dissipated parents in the lower classes of society. The countenances of persons affected with red gravel often appear florid, and the appetite is good; but in this form of the disorder the face is pale, and appears careworn; the patient is unfitted for any ordinary mental or bodily exertion; he becomes irritable, discontented, and gradually loses flesh; he has little or no appetite, and is troubled with flatulency, constipation, and other symptoms of indigestion. In this state of things the patient, if residing in a large town, should remove to a healthy part of the country, and remain as much as he can in the open air; he may take daily a few glasses of wine, or some sound malt liquor; his diet should be nutritious, and composed of such articles as the stomach will most easily digest. Where the object is to invigorate the system and improve the general health, it would be impossible to lay down a general rule with regard to the kind of food which ought to be taken; this must depend on the peculiarities of constitution and previous habits of each individual. As the celebrated Van Swieten justly remarks, "to assert a thing to be wholesome without a knowledge of the condition of the person for whom it is intended, is like a sailor pronouncing the wind to be fair without knowing to what port the vessel is bound."

To quiet the irritability of the system which always accompanies this form of the disorder, *opium* will be found an invaluable remedy; it may be given to the extent of two or three grains daily until the irritation is in a great measure quieted. To correct the predominance of alkali or alkaline earths in the urine, it is usual tc prescribe acids. Ten drops of *diluted muriatic acid*, or the same quantity of *elixir of vitriol* or *diluted nitric acid*, may be given three times a day in an *infusion of gentian* or *calumbo.*

STONE IN THE BLADDER

Arises, in the great majority of cases, from a portion of gravel having passed from the kidney along the ureter to the bladder, and there gradually increased in size by successive depositions upon its surface; sometimes it originates in the bladder, and occasionally the nucleus of the stone consists of a clot of blood, or a foreign body which has accidentally got into the bladder, such as the broken end of a catheter, or a portion of a bougie.

The immediate relief which follows the escape of a small stone from the kidney into the bladder often deceives the patient, and leads him to believe that all danger is past. The means most likely to secure the passage of the stone out of the body are not resorted to, and this neglect is generally fraught with consequences of the most distressing and ultimately dangerous nature.

Should timely measures not be adopted to remove the stone, a train of painful symptoms are sooner or later manifested, and the patient's life is rendered miserable. At first a dull uneasy sensation is occasionally felt about the neck of the bladder, at the lower part of the belly, or in the groin, and the patient experiences an unusually frequent desire to make water. The symptoms soon undergo a change for the worse, the desire to make water becomes more frequent and urgent, with an inclination to empty the bowels at the same time. While the urine is flowing the stream is suddenly stopped, so that it is expelled, as it were, by fits, the expulsion of the last drops being attended with excruciating pain. The urine is mixed with mucus, and is often tinged with blood, particularly after exercise; pain is frequently felt at the point of the penis, more especially after making water, walking, or taking any ordinary bodily exercise. "This pain is one of the most marked symptoms of the disease. A child who labors under stone tells you of it, not in words, but in his actions. He is always pulling at the end of the penis, and pinching it with his fingers, even so as to cause the prepuce (foreskin) to become elongated. You often find his fingers with the skin soft and sodden, as if they had been soaked in water, from the urine which had been imbibed."

The suffering is greatly aggravated by the motion of a carriage or riding on horseback.

A patient affected with stone in the bladder may do much to palliate the painful symptoms to which it gives rise, by strict attention to diet, and the judicious use of medicine. Whatever remedies are employed, they should be directed to correct the particular states of the constitution on which the formation of different kinds of stone depend. If the lithic-acid condition of the urine predominate, which is generally the case, the alkaline remedies already directed should be had recourse to, not with the expectation of dissolving the stone, but of restoring the urine to its healthy state, and improving the general health. Great care should be taken in proportioning the doses of these remedies to the particular circumstances of each case.

Surgery possesses two methods of extracting a stone lodged in the bladder. The *first* is *Lithotomy*, an operation which consists in making an incision into the bladder sufficiently large to allow the surgeon to lay hold of the stone with forceps and extract it entire. The *second* is *Lithotrity*, which consists in breaking the stone within the bladder, by means of certain instruments constructed for the purpose, so that the fragments may be discharged from the bladder by the natural passage.

Patients should not be afraid to undergo either of these operations when recommended by a competent and honorable surgeon.

STRICTURE OF THE URETHRA.

When a part of the canal or *urethra* which conveys the urine from the bladder out of the body is rendered narrower than it is in a natural state, in consequence of morbid action or a change of structure, the disorder is called stricture. Writers on this subject generally agree in describing strictures under three forms: the spasmodic, the inflammatory, and the permanent.

Spasmodic stricture, not associated with inflammation, is a rare disease. It comes on suddenly, and is not attended with pain until the patient attempts to make water. Various causes are said to give rise to this kind of stricture: it may proceed from exposure to cold and damp, excesses in drinking wine, spirits, &c., retaining the urine too long in the bladder, irritation of distant parts; or "even an irritated state of mind, or a mind deeply engaged in study, will occasionally influence the nervous system to such a degree as to produce spasmodic stricture of the urethra."

Treatment.—Put the patient in a warm bath. In obstinate cases administer æther to relax the parts, and introduce a bougie or catheter. "You should introduce a bougie," says Sir A. Cooper, "letting it steal gently along the urinary passage, and when it arrives at the strictured part there let it rest for a short time; after this you should gradually push it forward, using only a very slight force, but continuing that force until you have succeeded in passing the stricture. Let the bougie rest for a minute or two in the strictured part, and then withdraw it; the patient will be immediately enabled freely to pass his urine. If you have not a bougie at hand you may employ a catheter, and it will answer equally well; you must take care, however, to use it gently, as I have just described." The chief point to be attended to in such cases is not to irritate the parts by attempting to pass the stricture with a bougie, or to reach the bladder with a catheter. If much resistance be offered to the introduction of instruments, it will be better to have recourse to other means rather than persist in overcoming the obstacle by using force. The bowels should be well cleared out by means of copious injections of warm water, and afterwards an injection consisting of fifty or sixty drops of laudanum with a wine-glassful of warm water should be administered, or from forty to fifty drops of this medicine may be given by the mouth; and the dose may be repeated after a few hours, if the patient be not relieved. (See *Urine*, *Retention of.*)

PERMANENT STRICTURE.

This is by far the most common form of stricture, and in the great majority of cases proceeds from gleet or frequent attacks of gonorrhœa, riding horseback, and so forth. Astringent injections employed in the cure of gonorrhœa and gleet are sometimes the causes of stricture.

The number of strictures varies in different cases. The usual number is one, or at most two; but cases have occurred where six, or even more, existed at the same time. The form of stricture also differs. In the callous or indurated stricture the whole circumference of the passage, or only a part, may be affected. Some strictures are confined to a small part of the circumference of the urethra, or they may occupy from half an inch to an inch of the canal; in other instances, again, the stricture is formed by a small band stretching across the urethra.

It frequently happens that persons, either from ignorance or inattention, are affected with stricture for a considerable length of time without their knowledge; but as the disorder gains ground the symptoms become sufficiently urgent to attract the patient's attention, and convince him of the nature of his ailment. "At the commencement of every permanent stricture you are made acquainted with the real nature of the complaint by the following symptoms. The first is the retention of a few drops of urine in the urethra after the whole appears to have been discharged, so that when the penis has been returned into the small-clothes the linen becomes slightly wetted; and if you press on the under side of the urethra a few drops more will be voided, which had collected between the bladder and that part of the urethra where the stricture is situated. The next circumstance you notice is an irritable state of the bladder. This is evinced by the person not being enabled to sleep so long as usual without discharging his urine. A man in health will sleep for seven, eight, or nine hours without being obliged to empty his bladder; but when he has a stricture, he cannot continue for a longer period than four or five hours, and frequently much less even than this. The next circumstance observable is the division of the stream; the reason of which is, that the urethra is in an uneven state from the irregular swelling that surrounds it, and consequently the urine is thrown with an inequality of force against its different sides; sometimes the stream splits into two, becoming forked; sometimes it is spiral; at other times it forms, as it were, a thin sheath. Occasionally the stream rises perpendicularly, its long axis being at right angles to the long axis of the penis; thus, then, the retention of a few drops of urine after the whole appears to have been discharged, a more frequent propensity to make water than when in health, and the peculiar character of the stream, as just described to you, will be conclusive evidence of the existence of stricture."

Treatment.—Patients afflicted with permanent stricture should place themselves under competent surgical care whenever possible.

Various plans have been proposed for the cure of permanent stricture, but almost the only method of treatment now employed is the gradual dilatation of the part by means of bougies.

The first thing to be done is to ascertain the situation of the stricture, by passing a common-sized bougie into the urethra. The introduction of this instrument requires considerable caution and address; it should be first warmed before the fire, or dipped in warm water, then smeared with olive oil or lard; if made of wax, it should be slightly curved in the form of a catheter, and is then to be gently passed along the canal until the stricture prevents it from proceeding farther; it is then to be withdrawn. On the following day, a small conical or taper-shaped gum-elastic bougie is to be introduced; it should be of the same size as the stream of urine, and, being previously greased as above directed, is to be carefully passed along the urethra. When it reaches the stricture it should be allowed to rest a little, and is then to be pushed gently forward; if resistance be still offered it must be again allowed to rest for a minute or two, so as to avoid producing irritation or pain. If we succeed in introducing the instrument through the stricture, the cure is then in our power; but sometimes this cannot be effected without repeated trials and a great deal of trouble. When the bougie is introduced, it becomes tightly grasped by the stricture, and the patient is to retain it in that position until it passes through the stricture easily; this generally soon takes place—in many cases only a few minutes are required; it is then to be gently withdrawn. On the next day, or not until the expiration of two or three days, if irritation occur, the same bougie is to be again introduced, and if it pass easily, one a little larger is to be employed, and the same directions followed. In this manner the treatment is to be conducted, substituting successively larger bougies, always taking care to allow sufficient time to elapse between each introduction, in order to avoid irritation of the urethra; should this arise, the employment of a larger instrument is to be deferred until the symptoms of reaction pass off. By thus steadily but cautiously persevering in the introduction of bougies, the stricture will be at length overcome, and the largest bougie may be passed with facility. Five or six weeks, or perhaps a considerably longer period, may be required to complete the cure; but this mode of treatment, though slow, is safe, and very successful. No attempt should ever be made to get rid of a stricture suddenly, because it has been well ascertained that the dilatation is the more durable the more slowly it has been effected.

After the stricture is relieved the patient should pass a bougie or a catheter, once or twice a week, for a fortnight or three weeks, and afterwards at longer intervals. Should the stream of urine at any time diminish, he must again have recourse to the gradual process of dilatation above described, until the cure be permanent.

In long-neglected strictures, it sometimes happens that even the smallest instrument cannot be introduced into the bladder. In cases of this description much benefit will be derived from very carefully introducing a bougie every day, and gently pressing on the face of the stricture. By patiently persevering in this mode of treatment, a depression is made on the anterior part of the stricture, and ultimately the bougie will penetrate the constricted part. The cure may then be completed by gradually dilating the stricture, as already directed. Sometimes five or six weeks are required in obstinate cases before the instrument can be passed, but in general the obstruction is soon overcome.

STRYCHNINE.

This is the alkaloid of nux vomica. It is a remedy that at the present time is very much used. It is a medicine of great power, and must be given in small doses. Its main action is that of a tonic to the nervous system. It has a special influence on the spinal cord. For nervous diseases it is probably more efficient than any other internal tonic that we have. It is given in paralysis, nervous exhaustion, constipation, epilepsy, chorea. In paralysis it is sometimes administered by the hypodermic syringe. (See *Hypodermic Injections.*) The dose of strychnine is from one-thirtieth of a grain to one-tenth of a grain. The effects should be watched. It can hardly be called a domestic remedy. Those who have no medical adviser would do better to take the *tincture of nux vomica.* (See *Nux Vomica.*)

STY.

A sty is simply a small boil, projecting from the edge of the eyelid. Matter forms slowly, but at last the tumor is observed to point; that is to say, a small white speck appears on its most prominent part. After a longer or shorter period, sometimes two or three days, it bursts, and a small quantity of matter is discharged along with a little mass of disorganized cellular membrane commonly called the *core;* the swelling then subsides, and the eyelid soon resumes its natural appearance. But it often happens that only a small quantity of curdy-looking matter is discharged, and the core is retained within the tumor; the opening heals, and the swelling continues for a considerable length of time. In other cases, again, the suppurative process advances slowly, and the sty remains hard and painful, without showing the slightest disposition to point, or to undergo any further change.

Treatment.—The treatment of styes is very simple. They usually get well of themselves, but their course may be hastened.

Apply warm poultices of bread and water, or of linseed meal, enclosed in a small linen bag. A fresh poultice should be applied at least three or four times in the course of twenty-four hours, and each time the eye must be well fomented with warm milk and water. These local applications are to be assiduously employed until the suppurative process is completed, and the matter discharged.

SUBCARBONATE OF AMMONIA.

The subcarbonate of ammonia, or hartshorn, is a powerful stimulant and antispasmodic. It is sometimes employed as a sudorific, but is more frequently used as a stimulating application to the nostrils in fainting (*sal volatile*). The dose of this salt is from five to fifteen or even twenty grains.

The aromatic spirit of ammonia is a more agreeable stimulant than spirit of hartshorn, and is employed in weakness of the stomach, languor, fainting, flatulent colic, hysterics, and other nervous disorders. The dose is from half a drachm to a drachm in a wine-glassful of water, and repeated from time to time until relief is obtained.

Liquid hartshorn mixed with olive oil forms the *volatile liniment*, a useful external application for sore throat. All the preparations of ammonia should be kept in stoppered phials.

SULPHITE OF SODA.

This remedy is now used to *prevent fermentation*, and as an antidote to the poisons in the blood in certain fevers. Good results have been claimed for it in *dyspepsia*, in *diseases of the skin*, in *erysipelas*, in *scarlet fever*, in *typhoid fever*, and in *yellow fever*, in *diarrhœa*, in *dysentery* and *cholera*. It is a good disinfectant. The dose is from *ten to fifty* grains three or four times a day, or even more frequently. In the proportion of half an ounce to a pint of water it may be applied externally.

SULPHUR.

Sublimed sulphur, commonly called the flowers of sulphur, acts as a mild laxative and promotes the insensible perspiration. It pervades the whole system, and transpires through the pores of the skin, as appears from the smell which exhales from the bodies of persons who are under its influence, and by staining silver in the pocket of a blackish color. Equal parts of sulphur and magnesia (fifteen grains or a scruple of each) taken every night at bedtime affords great relief in piles.

This remedy, employed both internally and externally, has long been celebrated for its power of curing the itch and other diseases of the skin. (See *Itch.*) When taken alone for some time it produces a slight degree of feverish excitement; hence its use should b continued occasionally, and a Seidlitz powder or some other saline medicine administered. The dose, as a laxative, is one or two drachms in milk, or mixed with molasses, jelly, or some kind of conserve.

SULPHURIC ACID.

This acid is generally administered in the form of *elixir of vitriol*, which is an excellent tonic in the dose of from ten to twenty drops, twice or thrice a day, in a cupful of cold water. It is sometimes of very great service in indigestion, where bitter and aromatic remedies have failed to produce any good effect; and is employed in spitting of blood, and *to check excessive perspiration* in consumption. It may be advantageously combined with the decoction of Peruvian bark, or of quassia.

SUNSTROKE.

This is a sudden attack in hot weather, and after or during exposure to the heat, of loss of consciousness, with convulsions or stupor. The affection oftentimes so closely resembles apoplexy that it is difficult to distinguish it. It is sometimes called "heat apoplexy." It does not, however, have the paralysis of one side of the body that accompanies apoplexy.

Patients are suddenly taken with pain in the head, sickness at the stomach, vomiting, dizziness, blurred vision, general feeling of weakness that goes on to unconsciousness. Before assistance arrives the patient is generally in a condition of stupor. The pupils are sometimes dilated and sometimes contracted. The pulse at first is full, as in apoplexy; but afterwards becomes feeble. The disease is fatal in half the cases.

TREATMENT OF SUNSTROKE.

For cases that are very much debilitated.—Remove or loosen the dress of the patient, and do not attempt to take him home or to any hospital, unless near by. Let the air about him be as cool as possible. Give small doses of whiskey or brandy by the mouth, and inject some into the bowels. Sponge the surface of the body with spirit and water. *Avoid* purges and emetics.

For cases that closely resemble apoplexy.—Apply cold to the head, ice, and wet cloths; raise the head; apply mustard plasters to the calves of the legs; give a drop of Croton oil on the tongue. (For other treatment, see *Apoplexy*.)

The history of the early investigations of sunstroke are thus presented by Aitken:

"One of the earliest accounts of sunstroke, in which its nature was distinctly recognized, is that given by Mr. Russell, of the 73d Regiment, while in medical charge of the 68th, in May, 1834. The regiment had then recently arrived in Madras—a fine corps of men in robust health. The funeral of a general officer being about to take place, the men were marched out at an early hour in the afternoon, buttoned up in red coats and military stocks, at a season, too, when the hot land winds had just set in, rendering the atmosphere dry and suffocating even under the shelter of a roof, and when the sun's rays were excessively powerful. The funeral procession forthwith advanced; and after having proceeded two or three miles, several men fell down senseless. As many as eight or nine were brought into hospital that evening, and many more on the following day. Three men died—one on the spot, and two within a few hours. The symptoms observed (and they were alike in the three cases) were, first, excessive thirst and a sense of faintness; then difficulty of breathing, stertor, coma, lividity of the face; and, in one whom Dr. Russell examined, contraction of the pupil.. The remainder of the cases (in which the attack was slighter, and the powers of reaction perhaps greater, or at all events sufficiently great) rallied; and the attack in them ran on into either an ephemeral or more continued form of fever. The symptoms of these cases did not more nearly resemble each other than did the post-mortem appearances. The brain was healthy in all; no congestion or accumulation of blood was observable. A very small quantity of serum was effused under the base of one; but in all three the lungs were congested, even to blackness, through their entire extent; and so densely loaded were they, that complete obstruction must have taken place. There was also an accumulation of blood in the right side of the heart, and in the great vessels."—(*Medical Gazette*, "Graves's Clinical Lectures.") *Aitken.*

SUPPOSITORIES.

Suppositories are medicinal substances introduced in a solid form into the rectum, there to remain and dissolve gradually. In this manner opium, the extracts of henbane, hemlock, &c., are employed to relieve the pain and irritation arising from diseases of the lower bowel, the womb, the bladder, the prostate gland, and adjacent parts. Aloes and soap are sometimes introduced as a suppository, to destroy the small thread-worms called *ascarides*.

SWEET SPIRIT OF NITRE.

Sweet spirit of nitre is obtained by distilling alcohol nitrous acid; it is an excellent sudorific in the dose of a drac and a half or two drachms, given with a basin of warm gruel, some other warm drink, at bedtime. When taken in this man at the *commencement* of a common cold, it generally succeed arresting the progress of the disorder. This medicine also acts diuretic when given in smaller doses frequently repeated, mixed cold water; but is more frequently used to correct or promote action of more powerful diuretics in dropsy.

SYPHILIS, OR VENEREAL DISEASE.

There are few complaints either more prevalent or more inter ing to the public than the venereal disease. The business of medical man is to relieve the bodily sufferings of his fellow-m without inquiring how those sufferings may have been produ His duty is simply to prevent or cure disease, by medical cou or the administration of remedies; and he may, with a safe science, reject all other considerations, provided he can attain great object of his labors—the restoration of health.

The venereal disease, or syphilis, arises from the introductio a peculiar animal poison into the system. The manner in which poison or virus is generally introduced is well known.

CHANCRE.

As we have already observed, syphilis arises from the effect an animal poison on the body. The poisonous matter is place contact with some part of the genital apparatus and there excit sore, which secretes poisonous matter similar to that which first rise to the sore; after a certain lapse of time the poisoned matt taken up, mixes with the blood, and produces a regular succes of disorders or secondary affections in the skin, throat, or parts of the body. The sore produced by the application of syphilitic virus to the skin is called a *chancre*, but it does not fol that every sore which may appear on the genital parts after imp connection is a syphilitic sore or chancre. Hence, a very import question presents itself—viz., by what means can we distiug simple sores from the true venereal ulcer or chancre. This question more easily asked than answered. The medical man always ascertain the virulent nature of a sore by inoculation;

this is an experiment which others should never venture to make. It will therefore be more prudent for such persons, as a general rule, to regard *all* sores on the genital organs as syphilitic, provided they treat them in the manner presently to be described.

The progress of the sore will assist better in deciding upon its nature than any external characters. The true venereal ulcer commonly pursues a certain course for some time, and is not much influenced by ordinary applications; hence, says Mr. Colles, "if an ulcer be not interfered with by any stimulant or caustic application, and after eight or ten days it shows no disposition to heal, and if at the same time there be an absence of any cause (such as defect in the general health) to account for this obstinate condition of the local disease, we may then pronounce the ulcer to be syphilitic."

It is unnecessary to confuse the reader with minute descriptions of its varieties; for all practical purposes it will be sufficient to distinguish the five following forms—viz., 1, the common chancre; 2, the indurated chancre; 3, the irritable; 4, the inflammatory; and, 5, the sloughing chancre.

Indurated Chancre.—This is the sore which has often been called the Hunterian chancre, because it was so perfectly described by the great John Hunter. It is supposed to constitute the most regular and perfect type of the venereal ulcer, but it is now met with much less frequently than in former years. In men, chancres generally make their appearance on the glans penis, frænum, or at the angle between the skin and glans, because these are the parts on which the virus is most easily retained; in some rare cases the virus gets into the urinary canal or urethra, and gives rise to a hidden chancre in that part; and this explains the fact why many persons are affected with constitutional symptoms who have never had any appearance of sore or ulcer on the external parts. In females, the sores may occur on any part of the genital organs, in the vagina, or even as high up as the neck of the womb.

The interval between the application of the virus and its effects on the parts is very uncertain; in some few instances, chancres appear within twenty-four hours after the application of the matter. Generally the interval varies from three days to a week; but cases are on record where the disease did not appear until after several weeks. The first appearance of a chancre is generally indicated by an itching in the part where the sore is about to form; a small pimple then arises; this soon contains matter, and turns into a regular ulcer; the base of this ulcer feels hard when it is pressed between the fore-finger and thumb; the edges are regular, and the thickening of the tissues which surround it does not spread far into the neighboring parts, but is very circumscribed; the edges of the ulcer are surrounded by a narrow line of inflammation (areola), somewhat similar to that which encircles the small-pox pustule. The bottom of the sore is usually covered with a grayish yellow-colored matter, which adheres *tenaciously* to the abraded surface, and differs evidently from common pus; after some time the secretion becomes altered, and the edges of the sore lose their sharp aspect and become rounded off, the inflammatory areola disappears, small granulations form on the surface of the sore, and it gradually heals, leaving a hardened red mark or cicatrix, which is very apt to break again.

Simple Chancre.—This is the most common form in which the disease appears at the present day. In general features it resembles the Hunterian chancre just described; but the base of the sore is free from *hardness*, and it is not attended with signs of irritation or inflammation.

In *irritable* chancre the surface of the sore is red, and bleeds on the least touch; it is painful, often of irregular appearance, and has a tendency to spread whenever it is excited by irritating applications.

The *inflamed* chancre is nothing more than a simple venereal sore when it is attacked by inflammation; here the sore, generally in consequence of excesses on the part of the patient, becomes painful, red, and swollen; the regular appearance of the sore is lost, the edges are removed by grayish or black sloughs, and the secretions from the part are of a very acrid and irritating character.

Sloughing chancre generally occurs in persons of broken-down constitution, or who have injured their health by debauchery and excesses of various kinds; it is also apt to occur in those who give themselves up to drinking, &c., while under the use of mercury. In cases of this kind the original sore and the surrounding parts are rapidly destroyed by foul sloughs or gangrene; and unless the utmost attention be paid, the unfortunate sufferer may lose the greater part of the sexual organ.

Syphilis is a disease that no one should attempt to treat for himself, unless he is beyond the call of a physician. Unfortunately, many of those who are attacked by this dreadful malady are so situated that they are obliged to doctor themselves. For the benefit of such, I give an outline of the course of treatment. It is impossible for me to give the treatment in complete detail that will apply to every individual case. The truth is, that every case must be studied by itself. By carelessly treating one's self with this disease, most serious results frequently happen. (For further remarks on this subject see *Gonorrhœa.*)

Treatment.—The treatment of chancre is ***local*** and ***constitution-***

al. We shall first speak of the *local* means, and shall point out a few remedies on which the greatest reliance may be placed. The virus first excites a local sore, but four or five days may pass over before the virus is taken up by the absorbing vessels, and passes into the blood, to produce what are called constitutional symptoms.

This fact leads us to a first rule in the treatment of chancre. As soon as any sore or pimple appears on the sexual organs after impure coitus, it should be immediately cauterized, by passing over it lightly a stick of *lunar caustic;* this may be done twice in succession, but care should be taken not to press the caustic firmly on the sore, or carry it beyond the edges; our object is merely to destroy the *surface* which secretes the virus; a piece of fine dry lint should then be placed over the sore, and supported by any convenient bandage. When the eschar (scab, caused by the caustic) falls off, the caustic may be applied a second time in the same way, as a precaution. Even when the sore has existed for five or six days before it has been noticed, this mode of treatment may be employed. I should here observe that it is only applicable to simple and indurated chancre.

When the eschar has fallen off the sore should be dressed with some mild astringent or gently-stimulating application. The *zinc ointment*, weakened by the addition of one-third part of spermaceti ointment, is a very useful one; some practitioners recommend the *black wash;* if there be much pain and soreness in the ulcer the following will be beneficial:

Prepared lard, eight ounces,
Wine of opium, half an ounce.

A weak solution of alum, applied with lint, also forms an excellent dressing. During the use of these means the patient should live as quietly as circumstances will permit him, and avoid all excesses in food, drink, exercise, &c. The dressings should be changed at least three times every day.

Under this treatment common chancre will usually heal in a short time. The other forms of chancre require a somewhat different treatment, according to their nature. If the sore be of an *inflammatory* character, we must not think of applying caustic or any exciting remedies; the organ or ulcered part should be wrapped up in lint, moistened with tepid water or Goulard water, and covered with a piece of oiled silk; the patient should keep as much at rest as possible, live low, and take an opening draught occasionally. For *irritable* chancre the best local dressing is the opiate cerate mentioned above, or a strong aqueous solution of opium

We have now to speak of the *constitutional* treatment of chancre. When the means already mentioned have been applied *early* and assiduously, the patient has a great chance of escaping what is called secondary syphilis; and, as a general rule, I would not advise the use of mercury for any primary venereal sore except the *indurated* one. Experience shows that this form of sore is very often followed by secondary or constitutional symptoms, and that the cure of the sore itself is hastened by the use of mercury. It is impossible to lay down rules for the employment of this powerful remedy which shall suit every individual case. Generally speaking, the safest preparations that can be employed are *iodide of potassium* in doses of five grains three times a day, and *bichloride of mercury* in doses of one-twelfth of a grain. Should the mercury, as it sometimes does, occasion much griping or purging, three grains of the extract of *henbane* or one-fourth of a grain of *opium* may be added to the evening dose; it will not be advisable to push the mercury beyond touching the gums. The precautions to be observed during a course of mercury will be noticed when I treat of *constitutional syphilis.*

SECONDARY SYMPTOMS, OR CONSTITUTIONAL SYPHILIS.

Bubo.—The virus which is secreted by a syphilitic sore may be taken up by the absorbent vessels of the part, and conveyed by them to one or more of the lymphatic glands situated in the groin, where it excites inflammation; the gland thus inflamed and swollen is called a *bubo.* This swelling generally commences on the second or third week after the appearance of the chancre; it may be ushered in by shivering and symptoms of fever; but, generally speaking, the patient's attention is first directed to it by some pain, stiffness, or uneasiness about the groin, and on examination he finds a small knot or tumor; this gradually increases in size and then as gradually disappears, or it may suppurate and break, continuing to discharge matter for weeks or months; in some cases, however, the bubo will remain obstinately stationary for a great length of time.

When a *bubo* first appears we should endeavor to keep it from suppurating by applying the *tincture of iodine*, and by *compressing* it with a tight bandage.

If the inflammation is very active it may be necessary to apply leeches.

If suppuration approaches in spite of all that we can do, we should apply poultices to favor the rapid formation of the pus.

Secondary symptoms are those which make their appearance after the venereal virus has been carried into the blood from a chancre, or syphilitic bubo; they very seldom come on before the second week, generally towards the fifth, sixth, or eighth week, but occasionally later. It is not easy to say what length of time may elapse between the occurrence of chancre and the subsequent breaking-out of secondary symptoms; still, there is much reason to believe that the stories of confirmed syphilis having appeared several years after infection are fabulous.

SORE THROAT.

This form of secondary syphilis occurs very frequently, and is often mistaken for common sore throat; on looking into the back of the throat we see a dusky redness, and here and there circular or semicircular patches, covered with a whitish and very *tenacious* secretion; these patches often occupy the surface of each tonsil; they may remain indolent for a length of time, but sooner or later they ulcerate, and form deep irregular sores; in ordinary cases the pain, inflammation, and swelling are much less than what we find in common sore throat.

The *local* treatment consists in using gargles, or in touching the sores with some stimulating application. As a gargle, the following will be found useful:

Diluted muriatic acid, one drachm,
Decoction of cinchona bark, four ounces.

To stimulate the ulcers, they may be touched occasionally with a strong solution of *lunar caustic* (fifteen or twenty grains to the ounce of water).

CONSTITUTIONAL TREATMENT OF SECONDARY SYMPTOMS.

When secondary symptoms, such as coppery spots on the skin, sore throat, &c., make their appearance after chancre, mercury must be at once employed, with the exception of the cases presently to be mentioned.

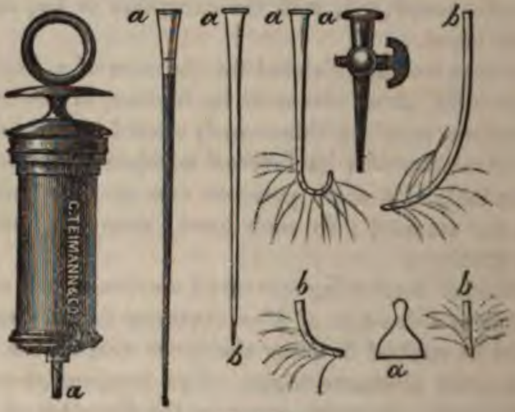
Mercury may be administered for the cure of syphilis in either of two ways—viz., as an ointment by friction, or internally. The choice of the form in which this remedy should be used must depend on several circumstances; its internal administration is usually the more convenient, but some patients cannot bear mercury when taken into the stomach; in such cases, therefore, we must have recourse to frictions.

The method of employing mercurial unction is very simple; from half a drachm to a drachm of *blue ointment* (mild mercurial ointment) should be rubbed in along the inner side of the thigh or leg before a fire every alternate night. The frictions should be alternately on the lower extremities and in the direction of the hair, in order to avoid, as much as possible, irritation of the skin. In some cases where concealment is necessary, instead of friction on the legs, a drachm of the ointment may be placed in the armpit on going to bed.

The best preparation of mercury for internal use is the *blue pill;* of this, five grains in the form of pill may be taken night and morning. Should it cause pain in the bowels or purging, a small quantity of opium (one-sixth of a grain) may be added to each pill; but if the purging be severe, and continue for more than two or three days, the use of mercury must be suspended.

I have already said that mercury is a remedy unsuited for certain states of the constitution; when, therefore, the general health of the patient will not admit of his undergoing a mercurial course, we must employ a remedy which is scarcely less efficacious in the treatment of secondary syphilis. This remedy is the *iodide of potash;* four grains may be added to a quart of the compound *decoction of sarsaparilla*, and the whole taken at intervals during the day. The iodide must be gradually increased until the patient takes fifteen or twenty grains in the above quantity of vehicle during the day. When it is not convenient to obtain the compound decoction of sarsaparilla, the simple decoction, or a decoction of *guaiacum*, with a few grains of nitre, will answer. In cases of foul, sloughing ulcers which occur in debilitated subjects, nutritious diet, with opiates at night and the *iodide of iron*, will afford the best chance of cure. The iodide of iron may be administered in the form of syrup or of pill; the quantity to commence with is two grains, which may be gradually increased to ten daily.

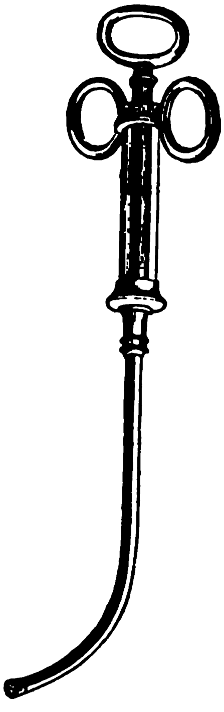
SYRINGES.



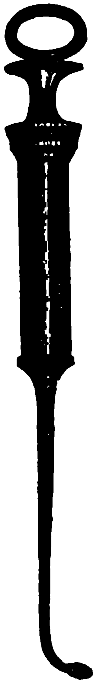
SYRINGES.

A large variety of syringes are now used by physicians. Besides the ordinary rubber and other syringes for injecting into the bowels, we have the *posterior nasal syringe* for injecting behind the soft palate in the nares. This is much used in the treatment of catarrh of the nose. (See *Catarrh.*) We also have syringes for the ear, the larynx, the urethra, the vagina, and the womb. Some of these are represented in the accompanying cuts.

Every family should be provided with some convenient syringe for the bowels. (See *Constipation, Treatment of.*)



LARYNGEAL SYRINGE.



POSTERIOR NASAL SYRINGE.

SYRUP OF HYPOPHOSPHITES OF LIME AND SODA.

This remedy has been proposed for consumption. The statement has been made that the tonic effects of this preparation are very decided; but it is yet on trial.

TARTAR-EMETIC.

Tartar-emetic, or the tartrate of antimony. Of all the preparations of antimony, this is the most to be depended on, and when given in appropriate doses is capable of fulfilling every purpose for which antimonial remedies are employed. The action of this salt varies according to the dose, and the state of the system at the time of its administration. In doses of three or four grains it acts powerfully as an emetic, and the safest plan of exhibiting it with this intention is by dissolving three or four grains in half a teacupful of water, and giving a tablespoonful of the solution every ten minutes till free vomiting takes place. Tartar-emetic is not so much used as formerly.

Tartar emetic, when applied externally in the form of ointment, produces an eruption on the skin resembling that of cow-pox, and is on this account frequently employed as a means of counter-irritation. A hot solution of tartar-emetic, rubbed in by means of a piece of flannel, produces pustules of a smaller size, which heal up without leaving any marks on the skin. This last method of counter-irritation is, therefore, preferable for females.

TAR-WATER.

This is prepared by "stirring a pint of tar with half a gallon of water for fifteen minutes, then allowing the tar to subside, and straining the liquid."

Tar-water is an excellent domestic remedy for the purposes of inhalation. (See *Inhalations.*) It is entirely safe, and may be used freely. Its effects on the mucous membrane of the air-passages are certainly agreeable. A mixture of equal parts of tar-water and paregoric has a soothing effect when inhaled.

TEETH, DISEASES OF, AND MANAGEMENT OF.

The art of dentistry of modern times has revolutionized the management of the teeth and the treatment of their diseases.

In spite of all our care the teeth will decay, although this decay may be retarded, and within certain limits prevented, by diligently brushing and cleansing the teeth. But we must not be satisfied with merely cleansing our teeth. If we have any pride whatever, or any desire for our future comfort, we should from time to time have our teeth examined by a good dentist, follow his advice, and submit to his treatment. It may be necessary to have all the teeth cleaned. There may be cavities that need filling with gold or amalgam. There may be some which have been neglected too long and must be extracted. Decayed teeth are frequently the cause of bad breath. (See *Bad Breath.*)

No one should now be afraid to visit the dentist on account of fear of pain. By the aid of nitrous oxide ("laughing-gas"), æther, and chloroform it is now possible to extract teeth without any pain whatever. The laughing-gas can certainly be taken with very little risk indeed. I have never yet seen any bad effects from it, though I have seen it given to quite young children, and adults in comparatively delicate health.

Parents owe it to their children to watch their teeth, to see that they regularly brush them every day, or better still, after each meal; and that they are early submitted to the examination of a dentist.

Nearly all cases of toothache are preventable by carrying out the principles I have indicated. (See *Toothache.*)

The following hints on the care of the teeth I extract from Shaw's treatise on this subject:

"TARTAR ON TEETH.

"This is a deposit almost wholly composed of lime and animal matter, in various proportions, frequently found upon the teeth. Its source and mode of deposit are uncertain. Dr. Harris gives an excellent summary of what is known on this subject, and declares that 'the conclusion appears to us irresistible, that this earthy matter is chiefly a salivary deposit, and takes place in the following manner: It is precipitated from the saliva as this fluid enters the mouth upon the surface of the teeth, opposite the openings in the ducts, from which it is poured. To this its particles become agglutinated by the mucus always found in greater or less quantity upon them. Particle after particle is deposited, until it sometimes accumulates in such quantities that nearly all the teeth are almost entirely encrusted with it.' When first deposited, tartar is soft and creamy in its appearance; but if allowed to remain, it loses a portion of its animal matter and water, and, as the lime predominates in its composition, becomes harder, and clings with great tenacity to the teeth.

"The adhesion of the tartar to the teeth does not directly induce decay; but indirectly, through the irritation of the gums which it occasions, it greatly promotes this malady. The deposit of tartar usually commences on the teeth at the edges of the gums. While soft it does not much interfere with these structures, but as it gets harder the gums are irritated and become inflamed.

"BRUSHING TEETH.

"It is a great mistake to use a hard brush, for if the gums be tender, either the brush will not be allowed to touch them, as is usually the case, and hence the teeth will not be cleansed at the edges of the gums (the very places where cleansing is most important); or else the gums will be unnecessarily lacerated and inflamed Besides, quite contrary to the popular belief, a soft brush in any case cleans better than a hard one. In using the brush, it should be applied to the lingual as well as to the labial surface of the teeth, and it should also be carried over them lengthwise as well as crosswise.

(*For receipts for tooth-powders see Prescriptions.*)

"Dead teeth and roots are frequently kept in the mouth under the impression that they prevent the cheek falling. When the front teeth are lost the lip falls, but it would be impossible to detect from the appearance of the face that a posterior tooth had been removed. This objection to the removal of a tooth or roots is therefore less puerile than mistaken; it may serve for an excuse, but it never can constitute an intelligent reason. And for a patient to endure the pain and baneful contingencies of diseased teeth on this account, is folly in the extreme.

"Even if the loss of a diseased tooth were slightly apparent, the author thinks that its deleterious effects on the health would, in many cases, give the face a more sunken appearance than would result from its loss. When several of the posterior teeth have been lost there may possibly be some appearance of it in the face; but this is nothing in comparison to the evils resulting from the presence of so many decaying and dead teeth in the mouth."

TEETHING.

When the first teeth are about to pierce the gums a certain train of symptoms usually occurs; these may be briefly noticed in order that they may not be mistaken for disordered actions; the edges of the gum where the tooth is about to come through presents a slight ridge or eminence; the infant becomes a little uneasy at night, cries frequently, and carries its fingers to the mouth; the point of the gum just above the tooth now becomes red and sore; it softens, then is covered with a white point, and at length the crown of the tooth makes its appearance.

While the symptoms which accompany dentition are of the local and mild character just described, the process may be regarded as natural. In many cases, however, the symptoms accompanying the eruption of the milk teeth are much more severe; the child is more or less feverish; the digestive organs are deranged, and vomiting or diarrhœa supervene; finally the local irritation in the mouth may extend to the nervous system, and excite either general convulsions or an almost endless variety of nervous disorders.

I shall examine each of these affections successively.

One of the most common effects of difficult teething is sympathetic fever; the febrile symptoms occur with various degrees of intensity, in some cases being very slight, in others extremely severe. Slight feverish action need excite little apprehension; but when the skin is very hot, when the child becomes exceedingly restless and refuses to take the breast, we must not neglect the sympathetic disturbance of the vascular system, lest dangerous consequences follow. As a general rule, it may be stated that, whenever any *serious* accidents accompany the eruption of the teeth, we should have recourse to the simple but efficacious operation of *lancing* the gums; this may be done with a gum-lancet or even a common pen-knife, the edge of the instrument being placed over the point where the tooth is about to come through; a cut may be made until the blade is felt to grate against the edge of the tooth. The operation may be repeated three, four, or even six times, on every alternate day, should circumstances require. To calm the general disturbance, tepid baths will be found useful, and the bowels may be opened with *manna*, the *syrup of senna*, or a few grains of calomel. No one who is not a physician should on any account administer *opium* by itself to infants of tender age.

The febrile disturbance now alluded to is often accompanied by *diarrhœa*, or looseness of the bowels; this may be considered as the most frequent accident of teething. When the diarrhœa does not last beyond four or five days, it is attended with no danger; but in many cases the looseness continues beyond this period, and is increased at the appearance of each new tooth; the child occasionally vomits up its food; the face assumes an unhealthy, dull, and leaden look; the flesh wastes away; and the little patient may be suddenly cut off by convulsions, or perish in a state of great exhaustion and debility.

Far from considering, then, the diarrhœa which accompanies teething as an useful flux that should not be interfered with, we are of opinion that it should be restrained whenever the looseness continues beyond a few days, or seems to affect, even in a slight degree, the general health of the infant. Lancing the gums must be had recourse to here, as in the former case; the state of the skin, which in old cases of this kind is generally dry and hard, must be improved by the use of the tepid bath twice a week. Should the looseness be attended with any signs of inflammation about the abdomen, then we must endeavor to remove this state, without reducing too much the strength of our little patient; warm fomentations may be applied to the belly; small doses of *ipecacuan* (two grains every three or four hours) may be given, unless vomiting accompany the diarrhœa. The *bromide of potassium*, or *pepsin*, or the *subnitrate of bismuth* may be given in the proper doses, according to the age of the child.

Vomiting generally arises from sympathetic irritation of the stomach; it can only be relieved by removing the irritation of the gums on which it depends; this may be done by the means already pointed out; and the same laxative medicines should be administered (unless diarrhœa exists), and the quantity of food given in the twenty-four hours must be diminished. *Oxalate of cerium* may be given for the vomiting—a very little dry on the tongue.

But the most dangerous affection to which children are subject during the period of teething is convulsions. The severity of the symptoms connected with the nervous system is extremely various; in some cases we have nothing but an undue degree of sleepiness; in others the effects on the general condition of the nervous system are shown by restlessness, want of sleep, starting in the sleep, flushing of the face, partial paralysis, squinting, irregular movements of the muscles; in a word, by an almost endless variety of nervous disorders. Thus, irregular motions similar to St. Vitus's dance are often connected with difficult teething. (See *Convulsions.*)

LOCKED JAW, OR TETANUS.

Tetanus is characterized by violent and painful contractions of the voluntary muscles of the whole or some part of the body, accompanied with tension and permanent rigidity of the muscles affected; the mental faculties and power of sensation remaining unimpaired.

The approach of this painful and dangerous disease is seldom announced by any premonitory signs. In general the earliest symptom is a feeling of stiffness about the neck and at the back of the head, which in most cases is first observed on awaking in the morning, or after sleeping during the day; this increases and extends to the jaws, while the throat becomes dry and slightly sore. These symptoms, however, so frequently occur from exposure to currents of air or other circumstances, and wear off without putting the patient to much inconvenience, that at the commencement of this disorder they are generally overlooked. But a train of symptoms soon follows which distinguish this from all other diseases. The muscles of the neck and jaws become rigid, painful, and are occasionally seized with spasms; the patient then finds considerable difficulty in opening his mouth; the power of swallowing is impaired; and before long a sudden spasm brings the teeth firmly in contact, so that the mouth cannot be opened by the most powerful efforts. If the spasms and rigidity do not extend to other muscles the disease is called *trismus* or *locked jaw*, which, though a less painful form than that in which the muscles of the body and limbs are affected, can scarcely be considered as less dangerous. The next circumstance which generally takes place is great difficulty of breathing, occurring in paroxysms, and accompanied with violent pain about the midriff or diaphragm; this is occasioned by the spasmodic action and rigidity having extended to the muscles of the chest; but although the violent and painful contractions about the chest, and consequent difficulty of breathing, are much more severe at one time than at another, they never entirely cease, and constitute the chief source of the patient's suffering throughout the progress of the disease. The muscles of the belly are drawn in towards the spine, and in some cases become as hard as a board. When the disease is at its height the muscles of the limbs are also rendered stiff, and partake of the general spasm, which is sometimes so violent that the body is bent in the form of an arch, its whole weight bearing upon the crown of the head and the hips, or sometimes on the heels; in other instances, again, the body is bent so as to rest upon the forehead and toes; but this is a rare occurrence, and the lateral incurvation is still more rare. We have had several patients with chronic tetanus under our charge, in whom the trunk and limbs were perfectly rigid. In such cases the individual is completely helpless, and lies on his back.

The extraordinary postures into which the body is thrown during the paroxysms of spasms, the strangely and frightfully distorted appearance of the features, caused by the spasmodic contraction of the muscles of the face, and sometimes the expression of laughter or grinning which the countenance retains during the most intense pain, unite in rendering the patient a remarkable but truly painful object of observation. The eyes appear watery, and remain fixed, staring, and motionless in their orbits; sometimes the tears are seen to trickle down the cheeks; and in the more severe cases, the teeth are occasionally broken by the violent spasmodic action of the muscles of the jaws.

It rarely happens that any kind of treatment is resorted to at the onset of tetanus, because, as we have already mentioned, its earliest indications are common to other disorders of comparatively little importance, and are therefore almost invariably overlooked. The first symptoms which alarm the patient are slight stiffness about the jaws, and some degree of difficulty in swallowing, especially of fluids. These uneasy sensations are usually accompanied or soon followed by a painful feeling of constriction under the breast-bone. More importance is to be attached to these symptoms, if the patient has previously pricked, bruised, or in any way injured one of his thumbs or fingers, or if he has wounded one of his toes in cutting a corn; in a word, if he bear a wound, whether slight or severe, upon any part of his body or limbs, he may then be certain that the indications above mentioned announce the approach of a series of more urgent symptoms, which may soon place his life in imminent peril. He ought, therefore, to lose no time in endeavoring by active measures to ward off the sufferings with which he is threatened.

TREATMENT OF TETANUS.

Many methods of treatment have been proposed and attempted for tetanus, but all are uncertain.

1. Give a grain of opium every two or three hours.

Brandy or other stimulants may be given at the same time in large doses.

2. *Ice to the spine.* This may be applied wrapped in a towel or cloth, or in the ice-bags. (See *Ice-bags.*)

Important cures have been claimed by this method of treatment alone. It is certainly worthy of a trial.

3. *The inhalation of æther or chloroform is all the treatment that I can recommend.*

Tartar-emetic has been recommended.

LOCKED JAW OF INFANTS.

This affection is very common in warm climates, more especially in the West Indies, where it was formerly computed to have destroyed upwards of a third of the negro infants shortly after birth.

It usually occurs within the first ten days after birth, and has been ascribed to various causes, such as irritation produced by tying the navel cord, or by subsequent neglect of cleanliness, exposure to currents of air, and irritation of the bowels.

The infant, at the commencement of the disease, appears less lively than usual, and is observed to suck with some degree of difficulty; the jaw soon becomes stiff and immovable, and the child, being then rendered incapable of sucking the breast or of swallowing, gradually sinks, or dies in convulsions.

Dissection has thrown no light on the nature of this disease; no morbid appearances whatever were discovered in any of the bodies which we have examined.

TETTER, OR SALT RHEUM.

The names of diseases of the skin are very complicated. I describe the diseases under the names by which they are popularly known.

There are two diseases of the skin commonly called tetter: the one is dry and scaly (psoriasis); the other is moist, and known under the name of running tetter (impetigo).

THE SCALY TETTER, OR DRY SCALL,

Is characterized by irregularly shaped scaly patches, chiefly confined to the hands and arms, although they often appear on all parts of the body. Fissures or cracks are very apt to form in these patches, and give out a thin fluid, which is concreted into crusts or scabs. The surface under these is red, tender, and irritable. This disorder is always attended with heat and itching, which are more distressing at one time than at another. Sometimes it is periodical, vanishing and reappearing at certain seasons of the year. The patient generally suffers most in spring and autumn, in consequence of the sudden alternations of temperature which take place during those seasons.

Persons with dark complexion and full habit of body, whose skin is usually harsh and dry, are most subject to this kind of tetter; it is said to occur more frequently in women than in men, is often connected with gout and gravel, and is generally understood to be of a hereditary nature, and not contagious.

Many physicians are of opinion that scaly tetter is a species of leprosy. Whether this be the case or not, it must be admitted that these affections are closely allied, and often exhibit themselves in the same person.

HUMID, OR RUNNING TETTER,

Makes its appearance in circumscribed, irregular, round, or oval shaped patches of small pustules closely set together, which, after discharging their contents, continue to throw out a thin acrid matter. This dries, and forms into yellow or greenish-colored scabs, from under the edges of which the matter still continues to ooze, giving rise to itching, or a stinging or smarting sensation accompanied with heat. This disease may appear on any part of the body, and may continue for months or for several years, being kept up by repeated eruptions of pustules. It is not contagious.

This eruption often breaks out in children while cutting their teeth, in young people, and in females with fine delicate skin and rosy complexion. It generally appears in spring, and sometimes breaks out at that season for several years in succession. It may be developed on the neck, on the trunk of the body, or on the limbs; but in children the scabs are generally first observed on the middle of the cheeks, or at the sides of the nose, and gradually extend to the corners of the mouth and round the chin. The crusts or scabs resemble dried honey in appearance. When they fall off, the skin appears red and shining, and is sometimes deprived of the cuticle or scarf-skin. When the disease is not prolonged by successive eruptions, the crusts generally dry up, and after remaining two or three weeks fall off, and the skin gradually resumes its natural appearance.

This affection is often very difficult to cure in old people, more especially when it appears on the lower extremities; but it is never attended with danger.

Treatment.—In the commencement of this disorder frequent gentle doses of *Epsom salts*, or *sulphur* and *cream of tartar*, are to be taken; and during all its stages the diet should be sparing, and confined to farinaceous substances and milk, with a small quantity of animal food once a day. It may be necessary after some time to resort to the *carbonate of soda* or of *potash*, with *sulphur* as prescribed for dry tetter.

The best local treatment consists in dusting the parts with *tutty* or *calamine powder* (*oxide of zinc*), in order to absorb the acrid matter and thereby diminish the distressing sensation of itching. The constant application of tepid water, or *decoction of poppy heads* with *marsh mallow*, will also afford great relief.

Half a drachm of *nitric acid*, dissolved in a pint of barley-water, taken daily, is salutary. If this oppress the stomach, it must be discontinued for a few days, and the warm bath employed occasionally. In long-continued cases, which have resisted the remedies usually employed, this treatment seldom fails in effecting a cure in the course of a month or a month and a half. (*For other remarks on treatment, see Eczema, under Skin, Diseases of.*)

THERMOMETER IN MEDICINE.

The thermometer is now much used in the study of disease. There are different varieties constructed expressly for medical use. The best form is the *self-registering axilla thermometer*. In order to test the temperature of the patient the bulb of the thermometer should be kept in the armpit (axilla) from three to five minutes. In health the temperature in the armpit should be 98.4° or 98.5° Fahrenheit. It ranges between 92° and 100°. It is higher in the tropics than in cold regions by a degree. It is higher in children than in adults by one or two degrees. *This temperature is variously modified by disease.* Hence the value of the thermometer.

In scarlet fever the temperature rises to 108°, 110°, or 112°; in lung fever and typhoid it rises to 104°, 105°.

The temperature varies from day to day in many diseases, and with the hour of the day. Hence physicians who are accustomed to use the thermometer can, by its aid, determine the character of the disease and its progress for better or for worse from day to day.

TOE-NAIL, INGROWING OR INVERTED.

This affection is sometimes exceedingly painful, and may cause great distress. Sometimes the edges of the nail sink into the flesh and cause inflammation and ulceration. The disease is caused by wearing tight boots.

The best *treatment* is to scrape the nail very thin indeed with a bit of glass. The earlier this treatment is resorted to the better.

Next press some bits of cotton wool beneath the nail, so as to separate it from the inflamed and chafed flesh. This treatment will usually give relief. It may be necessary to remove the nail in certain cases, but this operation is not advised by physicians so much as formerly. If actual ulceration has taken place, the best treatment will be the strips of adhesive plaster firmly applied over the toe. (See *Ulcers.*)

TIC-DOULOUREUX, OR NEURALGIA OF THE FACE.

Tic-douloureux is the term usually applied to a painful affection of certain nerves of the face. It may be seated in one of the temples, at the side of the nose, under the eye, or in the gums; sometimes the pain attacks one side of the head and face, and may extend to the eye or ear. But although this affection is for the most part confined to the face, it may nevertheless attack the extremities of the body, the female breast, the liver, the womb, or any other internal organ, and has in many instances been known to follow diseases of the skin; for example, it frequently succeeds the disorder called shingles, before described. The pain comes on in paroxysms, is of a peculiar kind, and differs from that which accompanies inflammation. The patient describes it as being lancinating, stabbing, sudden, and excruciating. In severe cases the pain is increased by the slightest touch, shaking of the room, or even by blowing upon the part, or by the least bodily exertion; and, when constant, delirium is sometimes the consequence. In some instances convulsive twitchings of the face are observed, and the tears are seen to run down the cheeks. There is perhaps no disease to which the human frame is liable, accompanied with more intense suffering than that which results from the more severe forms of tic-douloureux. The attacks at first are comparatively mild, do not occur frequently, nor continue long; but when the disease is confirmed they last for days, weeks, or even months, and may recur after very irregular intervals, without the slightest warning or any apparent cause; and it is worthy of remark, that although the long duration or constant return of severe pain may render the patient's existence a wretched burden, yet it appears to have very little effect in abridging the period of life.

Tic-douloureux, whether seated in the face or in any external or internal part or organ of the body, is distinguished from inflammatory disorders by the sudden manner in which it appears and disappears,—the absence of swelling, redness, heat of the part, and, in a word, of all the symptoms which characterize inflammation, with the exception of pain. It ought, however, to be observed, that in persons of an irritable habit of body the violence of the pain sometimes occasions a greater or less degree of febrile excitement. Of the *causes* of this disease we *know* nothing. But often a decayed tooth, or a disordered state of stomach and bowels, or general debility, may act as *exciting* causes.

Treatment.—(*For Treatment see Neuralgia, Treatment of.*) Tic-douloureux is to be treated like neuralgia of any other part of the body.

TONGUE-TIE.

Infants who cannot or do not suck readily are frequently called tongue-tied, and the physician is asked to divide the *frænum* below the tongue in order to cure. It is proper to say that this malady usually exists in the *imagination of the nurse.* The cases where the tongue needs to be liberated in this way are very rare indeed. *If the tongue can be put out of the mouth beyond the lips, or can touch the palate, no operation is necessary.*

The operation, although apparently slight, should never be undertaken by any one who is not familiar with the anatomy of the parts.

TOOTHACHE.

Sometimes the pain may be relieved immediately by the application of a little *creasote* or carbolic acid, or by a little strong nitrous acid mixed with three or four times its weight of spirit of wine, introduced into the hollow part of the tooth by means of a hair-pencil or a little lint. But when the irritation extends to the periosteum or fibrous membrane which envelops the tooth and lines its socket, the pain becomes permanent and exceedingly distressing. The treatment in this case consists in the employment of warm fomentations of poppy-heads, blistering behind the ear, and drawing blood from the gums. When by these means the inflammation is subdued and the pain in a great measure relieved, the tooth should be extracted; or when the pain and inflammation have entirely subsided, the cavity should be filled with gold, zinc, tinfoil, or whatever substance an experienced dentist may deem the most appropriate.

A tooth much decayed and often attended with pain should certainly be extracted. This measure should also be adopted when a fungous growth begins to spring up in the hollow part of the decayed tooth. But when a tooth decays to a certain extent, and then remains stationary, without occasioning pain, it may be serviceable for many years, and ought not, therefore, to be rashly interfered with.

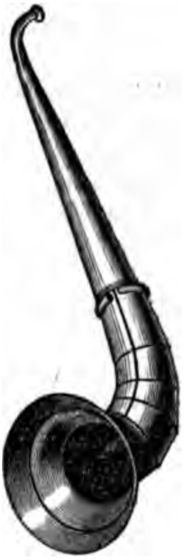
Toothache is sometimes intermittent. For example, it may come on every night, and wear off towards morning; and this sometimes occurs in teeth apparently sound, or only slightly decayed. In all such cases the tooth should not be removed until a fair trial has been given to *quinine*, or the *arsenical solution* as recommended under the head of *ague*. It is oftentimes very difficult to decide whether an apparent toothache proceeds from a bad tooth, or is a neuralgia simply. The best way to solve the difficulty is to consult a dentist. It is impossible to relieve the pain by the ordinary remedies for neuralgia.

The pain which arises from cutting the wisdom teeth (so called) may be relieved by scarifying the gums, and taking cooling saline purgatives.

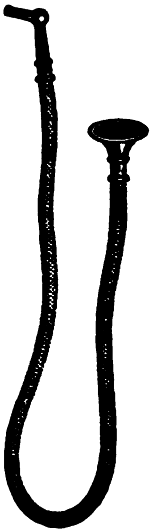
TRUMPETS FOR THE EAR.

The cuts represent some specimens of ear-trumpets, in which, unfortunately, quite a large number of people are more or less interested.

The best course to pursue when deafness comes on is to consult *without delay* some surgeon, to ascertain the *cause* of the deafness, and if possible to have it removed. Oftentimes it will be found that the trouble is only due to a collection of wax, that will be revealed to the surgeon by the otoscope, and may easily be removed by careful and persistent syringing with warm water; more frequently it will be found to depend on some form of inflammation that has extended from the throat to the middle ear, but which, if taken in time, may be relieved or cured. The *great and criminal mistake* of patients is to defer consulting medical advice for their deafness until relief or cure is no longer possible. For those who from neglect or from misfortune are afflicted with very *severe* and *incurable* deafness, the only remedy is to be found in some form of ear-trumpet. Many object to using these from motives of delicacy. This sensitiveness is both foolish and unnecessary. The incurably deaf, like the incurably blind, ought to meet their unpleasant fate honestly and squarely, and should not be ashamed to use any legitimate measures that may render their existence more comfortable. Unfortunately the best of our trumpets are more conspicuous and unsightly than eye-glasses or spectacles. "Spectacles for the ears" have not yet been discovered.



EAR TRUMPET.



CONVERSATIONAL TUBE (EAR-TRUMPET).

We need not be without hope, however, that in future time ad vancing science may devise some form of ear-trumpet that shall be more useful and less annoying than those that we now have.

TURPENTINE.

Oil of turpentine is much employed for destroying worms. To expel the tape-worm it is given in the dose of an ounce and a half to two ounces; and is also used against other intestinal worms in children, in the dose of a teaspoonful, or twice or thrice that quantity, according to the age.

An ounce of the oil of turpentine mixed with the yolks of two eggs and a pint of thin starch, constitutes an excellent clyster (injection) in cases of flatulent colic.

Turpentine is a very useful and safe counter-irritant in all internal inflammatory diseases, where counter-irritation is desired. A large piece of folded flannel, dipped in hot water and wrung as dry as possible, and then freely sprinkled with turpentine, should be applied with the least possible delay over the part where the pain is most severely felt, and carefully covered with a dry cloth to prevent evaporation; this is to be kept on as long as the patient can bear it, and should be renewed as often as may be found necessary. This method of counter-irritation has an excellent effect in determining the blood to the skin, is easily managed, and affords almost immediate relief. The external use of turpentine in this manner, when employed at the very onset, or in mild cases of inflammation, is sometimes of decided service.

TYPHUS FEVER AND TYPHOID.

Various species of continued fever have been described by medical writers, such as nervous, spotted, putrid, malignant, ship, and jail fevers; but of late years the observations of many scientific men, in this country and in Europe, have shown that nearly all these continued fevers that have been classed as distinct febrile diseases, are merely varieties of the fever of which I now propose to give a brief description, and which, in its mitigated form of typhus fever, is by far the most common kind of continued fever in this country. It is also generally admitted, that the numerous forms under which typhus fever appears, are owing chiefly to inflammatory affections of the brain, lungs, bowels, or other organs with which it frequently becomes complicated; thus giving rise to many symptoms not manifested in the simple or regular course of the disease. Patient investigation has also convinced nearly all the medical men who have taken the trouble to inquire into the subject, that typhus fever, in the great majority of cases, is distinguished from all other febrile diseases by a specific eruption of the skin, and moreover that, as a general rule, it only attacks the same individual once in the course of his life—thus obeying the law which governs small-pox, scarlatina, and other eruptive diseases.

Typhus fever sometimes commences abruptly; at other times it is preceded, during several days, by certain symptoms which are called precursory or premonitory. The patient feels low-spirited, debilitated, and fatigued; he becomes dull, morose, and complains of a sensation of constriction and oppression at the chest, and of soreness or lassitude of the back and limbs. The countenance is unusually pale and sallow, the eyes lose their natural brilliancy and appear languid, the breath is cold or fetid, and the appetite is lost. These symptoms vary in severity. They may be so slight that the patient does not confine himself to his room, and in some instances they escape particular attention. Observation has shown that usually the quicker and shorter this premonitory stage is, the more severe and rapid will be the subsequent fever.

First stage.—The fever begins with a sensation of cold at the loins, followed by shiverings alternating with flushes of heat, considerable depression of strength and spirits, restlessness, and general uneasiness. At the expiration of a few hours, fever in its more literal sense is manifested. The pulse is full and quick or oppressed, the head feels heavy, giddiness and headache are experienced, the face is flushed, or sometimes continues pale; there is considerable disturbance of the intellectual faculties, and an expression of distress is seen in the countenance, which is highly characteristic of the disease. The patient complains of constant thirst; the tongue is covered with a thin, whitish-colored fur; there is nausea; the bowels are often in a natural state; and the urine is scanty, high-colored, and hot. As the disease advances, the drowsiness increases; there is singing or buzzing in the ears, and the patient lies in a half-stupid state, and is unable to sit up in bed. When roused he still answers questions coherently, although in a slow and unusua manner; and when he awakes or is spoken to abruptly his countenance expresses an air of astonishment. There is now oppression at the chest; the general prostration is much increased, and in many cases there is cough with expectoration. On the fourth or fifth day, often at a later period, an eruption of pink or reddish-colored measles-like spots, about the size of the head of a pin, breaks out on various parts of the body, but chiefly on the chest and abdomen; they are slightly rough to the touch, and disappear when pressed upon with the fingers, but soon reappear when the pressure is removed. This rash usually continues from three to five days, but is occasionally so slight and indistinct, particularly in children, that it often escapes observation; and in some instances the fever runs through its different stages without the skin exhibiting the slightest appearance of any kind of eruption. Bleeding from the nose sometimes occurs about this period, and much relieves the head for a time. All the symptoms are aggravated during the night; the slumbers are short, disturbed, and unrefreshing, and there may be slight wandering or delirium. The duration of this stage is generally about a week.

Second stage.—The surface of the body, which may have been previously moist, is now dry, and greatly increased in temperature. If the hand be pressed upon it for a minute or two, a peculiarly hot, pungent sensation is communicated, which continues for some time after the hand is removed. The pulse is variable; it may be moderately quick, full, or soft, and easily compressed. In fatal cases it continues very frequent, generally above 125. Often a *deep-colored* red suffuses the cheek, approaching either purple or mahogany color. 'The tongue, which was at first moist, now begins to get brown, dry, and shrunken ; and the parched state of the throat causes some difficulty in swallowing. The desire for cold and acid drinks is still urgent. Small purple-colored spots, or numerous minute white vesicles, like millet-seeds, are frequently seen upon the skin about the eight or tenth day from the occurrence of the shivering. Sometimes the fever spots exist at the same time with the specific eruption already noticed. When this occurs, they both present nearly the same color, but may nevertheless be easily distinguished from one another. The brain is now more under the influence of the disease; the patient lies on his back in a sort of stupor, and appears careless about everything, although he is still aware, at times, of what is going on around him. When roused, he says that he is very well; his ideas are so confused that his answers to questions are generally incoherent, and he soon relapses into the same state of insensibility to external objects. He talks deliriously, and dreams without sleeping. This kind of delirium is almost characteristic of the disease. In some instances the delirium is noisy, and the patient requires restraint. The abdomen is painful when pressed upon, and sometimes becomes distended and tense. There is also purging to a greater or less extent, and in many instances dysentery comes on ; the urine is passed with difficulty, or may even accumulate in and distend the bladder; the hands tremble, twitchings or spasmodic movements of different parts are observed, and black adhesive mucous matter covers the lips, gums, and teeth.

Third stage.—Towards the fourteenth day, sometimes two or three days earlier, if the disease is about to terminate favorably, a gradual amendment of all the symptoms is observed. A slight degree of moisture breaks out in the skin; sometimes bleeding from the nose takes place; the tongue, gums, and nostrils become moist, while the dark-colored matter with which they are covered is detached and falls off, and the patient now expectorates easily and freely. In many cases, free perspiration breaks out all over the body and limbs, and emits a peculiar odor; the urine flows abundantly; the delirium ceases; the senses recover their activity; the patient is again able to sleep; the appetite returns; the strength gradually increases; and convalescence commences about the twenty-first day. The memory often remains impaired; while the buzzing in the ears, which has been more or less troublesome throughout the disease, and the deafness, continue long after the fever has ceased.

When, on the contrary, the disease proceeds to a fatal termination, the symptoms become more alarming, and new morbid phenomena are developed. The skin is covered with a viscid fetid sweat; the urine and fæces are passed involuntarily; the expectoration is dark-colored and fetid; gangrenous sores form on the parts which have been subjected to pressure; the delirium is low and muttering, and the patient picks at the bedclothes; the dead rattle (as it is commonly called) is heard in the throat, and death takes place about the termination of the third week, frequently at an earlier period, rarely later.

The congestion, or accumulation of blood in the principal internal organs, which always occurs to a greater or less extent in the course of this disease, frequently causes inflammation. The brain is more or less affected in every case; but inflammation only occasionally occurs, and then we are often unable to determine its existence. This complication is most frequently met with in young robust individuals, and is manifested for the most part during the first stage of the disease, sometimes within twenty-four hours from its commencement, by buzzing and other noises in the ears, severe pain in the head, throbbing at the temples, delirium, convulsive movements, &c.; sometimes nausea, vomiting, purging, and pain in the bowels are the predominant symptoms. The danger is then not so great as in the preceding case. In other instances, pain in the chest, bloody expectoration, cough, and difficulty in breathing indicate inflammation of the lungs; or inflammation of the liver may be announced by an acute pain of the right side, a jaundiced appearance of the skin, &c. These affections greatly increase the danger, and they are the more to be dreaded because the extreme drowsiness and oppression of the brain often prevent the patient from directing the attention of the practitioner to the affected organ, and often conceal their existence from ordinary observers.

Typhus fever frequently appears under a *very mild form (typhoid)*, which is in no way dangerous when not improperly treated. Griping in the bowels, aching pains in the limbs, and headache, with disturbed sleep, constitute the chief sources of complaint. The headache is generally aggravated towards night, but is seldom accompanied with much intellectual disturbance. Sometimes an air of astonishment is observed in the patient's countenance on awaking, and his ideas are slightly confused for a short time. This benign form of the disease does not occasion fear of contagion, is its most prevalent form with us, and generally lasts from twenty to forty days.

On the other hand, in severe epidemics, the contagious principle is so virulent that the vital powers soon become overwhelmed. The patient lies as if he were in a state of apoplectic stupor. Black spots soon appear in different parts of the body; dark-colored, unhealthy-looking blood issues from the nostrils; the prostration increases, and the patient dies before the seventh day from the commencement of the disease.

Much diversity of opinion still exists in the medical world respecting the cause of typhus fever. Many physicians believe that it cannot in every instance arise from intercourse with an infected person, and that it may be generated and developed by various external agents, such as filth, foul air, improper food, intoxicating liquors, &c., and afterwards become susceptible of communication from one individual to another.

The circumstances which operate in the diffusion of typhus fever are filth and impure air, deficient nourishment and food of bad quality, intemperance, a cold and moist state of the atmosphere, and everything of a depressing and debilitating nature.

All the excretions from a patient with the graver form of typhus are charged with contagious *effluvia*, which become highly concentrated when cleanliness is neglected, and the ventilation is defective.

The long-continued use of ardent spirits lowers the vital energies, weakens and emaciates the body, and prepares it for the reception of typhus contagion, or of any epidemic disorder which may happen to prevail; and thus keeps the system, as it were, constantly upon the brink of disease. Besides the injurious influence which the use of alcoholic liquors exercises directly upon the animal economy, a train of evils are indirectly induced. The family of the drunkard are deprived of sufficient food, fuel, clothing, and other necessaries and conveniences of life; while filth and all the concomitants of poverty, which so strongly tend to the diffusion of typhus fever, are brought into play; and hence the disease chiefly prevails in the districts of large towns where the greatest quantity of spirits is consumed.

DISTINCTION BETWEEN TYPHUS AND TYPHOID FEVER.

In typhus fever there is no bleeding at the nose or bronchitis; the bowels are constipated; there is an eruption, that does *not* disappear on pressure, about the 5th, 6th, or 7th day; progress more rapid than in typhoid fever.

Death may occur within 10 days.

In typhoid fever there are bronchitis and bleeding at the nose; gurgling in the bowels; diarrhœa; eruption of rose spots, that *disappear* on pressure; *very slow* progress.

Death not usually takes place under 14 or 15 days.

It is oftentimes quite difficult for the physician to distinguish between the two diseases. Typhus is rather more fatal than typhoid. Of the former, about one in ten or fifteen die; of the latter, about one in twenty.

The general principles of treatment are nearly the same for both diseases.

Treatment.—In mild cases of typhoid fever, convalescence is established between the fourteenth and eighteenth days from the commencement of the disease; that is to say, the patient, although still in a feeble condition, begins to relish his food and sleeps more soundly, while his tongue is tolerably clean and his pulse natural. In ordinary cases, as we have already mentioned in describing the disease, the patient cannot be considered convalescent until about the twenty-first day; and in the more severe cases the disease may be protracted to the thirtieth or fortieth day, or even later. In the treatment of typhus and typhoid fever, our remedies are to be directed, not to cutting short, but to controlling the fever, and relieving the local disorders which may occur during its course, until nature effects the cure. But when, after frequent contact with the sick, a person finds he has headache, pain in the back, and general lassitude, by taking an emetic at night, or a cathartic, or both, he may be relieved of these symptoms, which otherwise might prove the precursors of the fever.

In mild cases of typhus, or in the simple forms of continued fever, above alluded to, the only remedies required are mild laxatives, such as a little *castor-oil.* The daily use of purgatives interferes with the regular course of the disease, and might produce considerable irritation, or even inflammation of the bowels.

The two great remedies now used for typhus and typhoid fever are *pure air* and *stimulants. Pure air* is to be obtained by free and abundant ventilation of the sick-room, or, as has been success fully tried in some cases in hospitals, in moderate weather, removing them into *tents.* In treating these fevers we should carry out the suggestions of Florence Nightingale, to "*keep the air which the patient breathes as pure as the outside air, without chilling him.*"

If I were taken down with this disease I should desire, first of all, *pure air*, *good nursing*, and *stimulants* if I became debilitated. The old-fashioned method of bleeding, purging and dosing with all sorts of drugs in fevers is now abandoned, and very fortunately for our patients.

Stimulants are administered in the form of whiskey, brandy-punch, wine, and champagne. The doses of these stimulants, and the frequency of their administration, must be determined by the wants of each individual case. For this reason, among others, a medical adviser of experience is imperatively needed in these serious and exhausting diseases. A tablespoonful of brandy may be given every two, three, or four hours. Sometimes very much larger doses are given. All cases of typhus or typhoid fever do not need stimulants.

Beef-tea is to be highly recommended, either alone or connected with the stimulants.

Sponging the body with cold or tepid water and sprinkling the pillow and sheets is very beneficial in all cases; it diminishes the distressing heat and dryness of the skin, is soothing and grateful to the patient, and is sometimes followed by gentle perspiration and more tranquil sleep. When the skin is hot and dry, cold water may be employed with perfect safety, and without any risk of interrupting the regular course of the rash which usually appears on the skin; but tepid water is to be preferred if there be any degree of moisture on the skin, and at very advanced periods of the disease.

If rawness or excoriation of the hips, haunches, or back occurs, the part may be washed with a solution of ten to fifteen grains of *nitrate of silver* (*lunar caustic*) in an ounce of water, or with a weak solution of the *acetate of lead* (*sugar of lead*) in spirits of turpentine; and if sloughing or gangrenous ulcers form, *carrot poultices*, and the means recommended under the head of ***Mortification***, are to be employed. But we should endeavor to avoid these untoward occurrences by supporting the patient with pillows, so as to take off the pressure from the parts most likely to suffer; and in all tedious cases, when a tendency to excoriation is observed, the parts should be defended by soap-plaster. The India-rubber water-bed and the India-rubber air-pillows are the best means of guarding against the effects of pressure.

It sometimes happens, in the course of typhus fever, that the bladder becomes distended and incapable of discharging its contents. The state of this organ should therefore be carefully attended to; and if fulness or swelling be observed at the lower part of the belly, the urine must be drawn off with the catheter.

Ventilation of the sick chamber, as has already been stated, is always of primary importance, and is more particularly demanded in all contagious febrile diseases. But great care must nevertheless be taken to screen the patient from *currents* of air, and to regulate the temperature according to the stage of the disease and the state of the patient. As long as the surface of the body continues hot and dry the room should be kept cool and the bedclothes light; but towards the termination of the fever, or when the temperature of the body is considerably reduced, additional covering must be employed. The bed-pan for evacuations should be used on the necessary occasions, and the patient disturbed as little as possible; and should the evacuations be passed involuntarily, the bed should be protected by placing a piece of oiled silk or glazed cloth under the patient. The gums should be carefully washed, the linen and bedclothes frequently changed; and the necessity for the utmost attention to cleanliness in the patient's person, and to everything around him, must be obvious to every one.

During *convalescence* the patient should wear flannel next the skin, and avoid sudden alternations of atmospheric temperature. He must carefully abstain from premature mental or bodily exertion, and the return to his ordinary occupations ought to be *gradual and cautious.*

Diet and regimen.—During the first, or inflammatory stage of the disease, no kind of nourishment should be allowed beyond newly prepared whey or barley-water; but when the excitement subsides, small quantities of very light food should be given, such as thin arrow-root, gruel, tapioca, and vegetable jellies. When wine and stimulants are considered necessary, it will also be advisable to keep up the patient's strength with beef-tea, chicken or mutton broth, as before stated.

It may be inferred, from what has been stated in a previous part of this article, that the best means of diminishing the power of contagion, in this and other eruptive fevers, are *cleanliness and proper ventilation*. The attendants should avoid standing in a current of air which has passed over the patient, or, in other words, should stand between the patient and the channel through which the air enters the apartment; they should also avoid inhaling his breath, or leaning over him; and should avoid entering the sick apartment in the morning with an empty stomach. It will likewise be advisable to purify the room from time to time, by placing flat dishes, containing the *chloride of lime* mixed with water, on different parts of the floor.

The late Dr. Henry, of Manchester, discovered that clothes impregnated with the contagious effluvia from the bodies of patients with typhus, scarlatina, &c., are disinfected by exposing them to a temperature of 204° F. for an hour and three-quarters, and may afterwards be worn with perfect safety by healthy persons.

ULCERS.

Ulcers, whether proceeding from local or constitutional causes, are classed by surgeons under different heads, according to their appearances and the symptoms with which they are accompanied. The species of ulcers usually described are the healthy, the indolent, the irritable, and the sloughing, or phagedenic.

The *simple* or *healthy ulcer* is covered with small fleshy projections, which are of a red color, firm, and pointed. These granular eminences are closely connected, forming an equal surface, and are bedewed with cream-colored matter (*pus*). This form of ulcer is not painful, but is attended with a peculiar sensation of itching; its edges are smooth, soft, and though slightly florid, do not present the fiery-looking appearance of an inflamed part. Now, when an ulcer, whether proceeding from a wound, a burn, an abscess, or, in a word, from any other cause, either local or constitutional, exhibits these appearances, we know that the process which nature sets up for the restoration of the part is going on favorably, and needs no assistance from art. In fact, no means possessed of the direct power of promoting a cure are known; hence, all that remains for us to do is to preserve the natural process from interruption by defending the part from injury.

In ordinary cases, it will be sufficient to dress the sore with dry lint or old linen once in twenty-four hours, when it should be carefully washed with milk-warm water. If part of the dressing adhere to the edges of the ulcer, it should be carefully removed, so as not to produce irritation, or injure the numerous red points already noticed, called *granulations*. The necessity of protecting these little bodies from mechanical injury is obvious, because they secrete the matter which flows from the ulcerated surface, and without which the healing process could not be carried on; while at the same time they gradually fill up the cavity of the sore, until its surface reach the level of the surrounding skin—thus constituting the means adopted by nature for the completion of the cure. Many surgeons smear the lint, or whatever covering is employed, with a little *Turner's cerate*, *sugar of lead ointment*, or some other mild unctuous substance; this, however, is not done with the intention of expediting the cure, but merely to prevent the lint from adhering, and the edges of the ulcer from being injured on its removal. The dressing must be kept on by a roller wound round the limb, from its extremity to some distance above the sore. This is not to be applied so tightly as to produce pain, but with sufficient firmness to retain its own place and that of the lint, or whatever dressing may be employed.

When a wound cannot be healed by the adhesive process, or by what surgeons call the first intention, and when it is found necessary to open an abscess, we should apply warm poultices to the part, in order to promote the growth of granulations, until these have sprung up to a level with the surrounding skin. The poultices are then to be discontinued, and lint applied as above directed.

Sometimes the granulations become too luxuriant, and spring up higher than the edges of the sore, forming what is called *proud-flesh*, which may cover the whole or only part of the ulcer. When this occurs, we must touch the fungous part daily with *blue vitriol* (*sulphate of copper*), or *lunar caustic*, until it be brought down to the proper level; or we may apply pressure, by means of strips of adhesive plaster and suitable bandages. In some instances, the ordinary means of keeping down proud-flesh do not succeed; we then have recourse to the application of a piece of sheet-lead over the sore. When this measure is deemed necessary, a pledget of lint, covered with simple ointment, should be interposed between the lead and the ulcer, and a long roller or laced stocking applied so as to embrace the whole limb, and retain the lead in place.

The *indolent ulcer* is characterized by a smooth surface, without granulations, of various colors. Sometimes it is glossy or semi-transparent, or covered with a layer of viscid mucus; its edges are hard, white, and sometimes turned outwards, while the surrounding skin presents a varnished appearance, looks polished like a pebble, or exhibits a rough and scaly aspect. The limb on which this description of ulcer is seated is always more or less swollen, and the matter discharged is a thin, serous-looking fluid, or is tenacious and fetid.

Some people submit to all the inconvenience and discomfort of an indolent ulcer for years, being afraid to dry it up through a dread of injuring the system, and inducing some inveterate or acute disease by suppressing a long-continued discharge. These ulcers, however, may be healed with perfect propriety, provided proper treatment be adopted, and the patient adheres to a sufficiently rigorous diet, until the system accommodates itself to the change, and the state of the general habit is corrected.

The mode of treatment now generally preferred is that by pressure with adhesive straps, which is not only very efficacious, but possesses the advantage of being simple and easily managed. It is performed in the following manner. The limb having been shaved, a slip of adhesive plaster, about an inch and a half in breadth, is to be applied completely round the limb, about two inches below the ulcer; and, in order to fix the strap firmly, one end of it should be made to overlap the other; then a second strap is to be applied a little higher, so as to cover two-thirds of the first; then a third in the same manner, proceeding upwards until the ulcer is entirely covered, and an inch or two of the skin above it. Having completed this part of the process, a long cotton roller, three inches broad, is then to be wound round the limb, from the toes to the joint immediately above the sore, or a laced stocking may be employed in place of the roller. The ulcer should be dressed once in thirty-five or forty-eight hours; and if the patient complain of severe itching and heat at the part, the bandage must be freely moistened with cold water. The straps and roller should not at first be applied very tight, or in such a manner as to produce pain; but after they have been used several times the patient will, without inconvenience, bear to have the pressure considerably increased. This method of treatment soon produces the effect of subduing the swelling of the limb and reducing the callous edges of the ulcer; granulations begin to spring up and discharge cream-colored matter; the part assumes a healthy action, and presents the appearance of the simple ulcer, above described; and the cure is soon completed.

Although the most obstinate cases of indolent ulcer are often remedied by the above plan of treatment, yet it is not to be expected that this or any other method shall be invariably successful; we are therefore occasionally under the necessity of having recourse to other remedies. Various stimulants are employed to excite the growth of granulations, and induce a healthy action of the part. *Mild citrine* ointment spread on lint or on soft linen rag, or salve composed of an ounce of *basilicon* mixed with a drachm of the *red precipitate of mercury*, are useful dressings; but they must be used stronger or weaker, according to the effect produced. If the patient complain of smarting or pain, the strength of the ointment should be diminished by the addition of a little lard. The best plan, however, is not to persist in the use of any particular ointment or lotion, but to vary the dressing as soon as we observe that the ulcer begins to fall back into the same indolent state, or remains stationary. Whatever application is employed, the use of the roller should never be neglected, because there is no fact in surgery better ascertained than the efficacy of pressure in cases of indolent ulcer.

Irritable ulcers vary considerably in appearance in different cases. In general, the surface of the sore at the commencement presents a very unequal aspect; the granulations at some parts are seen shooting up too high, in others they are scarcely perceptible. There is much pain and tenderness of the part, and redness of the adjacent skin; the discharge consists of bloody matter, which Sir Astley Cooper compares to strawberry-cream in appearance. If the irritation be allowed to continue, the granulating action is gradually destroyed; the surface of the sore acquires a smooth, buff-colored appearance, the matter discharged is thin, and the part becomes exceedingly tender, and is very painful when touched. Sometimes this species of sore is level with the surface of the limb; at other times it is deep like a cup, with thin sharp edges, and continues to spread as long as the excess of action exists. Weak, irritable individuals, more especially those whose constitutions have been injured by intemperance, are most liable to this kind of ulcer; it also occurs in full-fed, plethoric persons.

In the treatment of irritable ulcers we must avoid everything which can keep up the excitement, and employ remedies of a soothing tendency. Of these, the best, if the excitement be merely local, are *fomentations of the decoction of poppy-heads*, and warm bread and milk poultices. The following ointment is strongly recommended:

Spermaceti ointment and
Citrine ointment, of each half an ounce,
Opium in powder, a drachm. Mix.

To be spread on lint, and applied to the part twice a day.

When an ulcer is of an indolent character, moderate exercise on foot may be allowed, and is even serviceable in many cases; here, on the contrary, motion would certainly have the effect of increasing the irritation, and absolute rest must therefore be strictly enforced.

The sloughing, or phagedenic ulcer.—The irritable ulcer without granulations is very liable to become affected with inflammation of a low character, which soon terminates in sloughing or mortification.

The sloughing ulcer generally arises from constitutional causes, such as great irritability of the system brought on by drinking spirits, by the abuse of mercury, or by the deleterious influence of an unwholesome atmosphere. The inflammation produced by the local application of certain morbid poisons may likewise end rapidly in sloughing ulceration.

When the sloughing has commenced, *carrot poultices* should be had recourse to; or a lotion composed of fifty drops of *nitric acid* to a quart of water may be constantly used, the strength being increased or diminished according to the patient's sensations. Carbolic acid—five grains to an ounce of water—is a good application. This application has an excellent effect in promoting the growth of healthy granulations. Oiled silk should be applied over the ulcer until the slough be detached, in order to prevent the disagreeable smell which would otherwise arise from the mortifying parts. The state of the constitution must be carefully attended to. In most cases the administration of *opium*, as already recommended, is found necessary. (See article *Varicose Veins.*)

URINE, INCONTINENCE OF.

When a person is unable to retain his urine, and it constantly passes off involuntarily, he is said to be affected with incontinence of urine.

Inability to retain the urine is a symptom of various disordered conditions of the urinary organs. In people advanced in life it is frequently associated with retention of urine. The bladder is constantly full, and every movement of the body causes the urine to escape; in this manner it passes involuntarily, as quickly as it is secreted by the kidneys. (See *Urine, Retention of.*)

Incontinence of urine is often connected with a weakened or paralyzed state of the lower limbs, which in many cases is caused by injuries done to the spine, or by some disorder of the spinal marrow. Sometimes, again, the paralytic condition of the inferior extremities, to which the incontinence of urine is obviously subordinate, comes on gradually, without any known cause. In such cases the bladder does not appear to be distended; but its sphincter muscle offers no resistance to the escape of the urine, which dribbles constantly from the parts, to the great discomfort of the patient. The treatment generally relied on in this form of the disorder consists in cold bathing, more especially the daily application of the cold douche to the lower parts of the body; the application of *blisters* to the lower part of the back (*sacrum*); the internal use of the *tincture of cantharides*, in doses of ten drops, three times a day, in half a teacupful of gum-water or linseed-tea; *belladonna* in the form of the tincture; and tonic remedies, such as *quinine* or the *prepared rust of iron*. In some cases the introduction of the *catheter* has been found serviceable. I have found *general electrization* efficacious in incontinence of urine. (See *General Electrization.*)

Children are particularly liable to incontinence of urine. In general, they are troubled with it only when asleep; but in many cases the calls to void the urine during the day are more frequent than in health; and the child, if spoken to sharply, or alarmed from any cause, makes water involuntarily. This nocturnal incontinence of urine sometimes resists every kind of treatment; but it usually gets well of itself as the child grows up and acquires strength. Much benefit may be derived from tonic remedies; of these, perhaps the most eligible is the *tincture of chloride of iron*, which should be given in doses of five drops three times a day, in a wineglassful of the infusion of gentian or decoction of whortleberry, and continued daily for several weeks or months, according to the circumstances. A succession of blisters to the sacrum, or lower part of the back, have been often successfully employed. Bathing the lower part of the abdomen and genital organs night and morning with cold water has often an excellent effect. The state of the stomach and bowels should be carefully attended to. Watery diet should be avoided, and tea prohibited in the afternoon. Eating shortly before going to bed is improper. Contrivances which mechanically prevent the discharge of urine often do serious mischief, and are never followed by any permanent benefit. In all cases of this disease in the male sex, a small bag of oiled silk or India-rubber cloth (Macintosh), appended to the parts, will be found very serviceable as far as regards cleanliness; and a piece of the same description of cloth, about a yard square, placed under the hips at night, it also conducive to cleanliness and comfort.

URINE, RETENTION OF.

Retention of the urine, or strangury, as it is commonly called, is either *complete* or *incomplete.* In the former case, no urine can be passed, or only a few drops are voided with great straining and at intervals, without affording any relief to the patient, whose state soon becomes one of the most distressing to which man is liable. In the latter case the symptoms are not so urgent, and the patient passes, occasionally, a considerable quantity of urine, without the pain or distention at the lower part of the belly being much, or in any degree relieved, or the restlessness and symptoms of general excitement abated.

Retention of urine sometimes occurs in persons who have been prevented from making water by delicacy, indolence, or other causes, until the bladder, from over-distention, has become so weakened that it loses its contractile power, and is unable to empty itself. In this case the feet ought to be placed in water as hot as it can be borne, and warm fomentations should be applied over the lower part of the belly, or the penis may be immersed in a basin of warm water; by these means, continued for some time, and the application of gentle pressure over the bladder, the patient will occasionally succeed in voiding his urine. The disorder, when depending on this cause, may be relieved by other methods of treatment; but in general it is found necessary to draw off the urine by means of a *catheter.* In many instances this instrument must be employed twice or thrice daily, or even more frequently, for several days or even weeks, until the muscular structure of the bladder recovers its tone. A simple and excellent method of restoring the tone of the bladder is to pour cold water on the lower part of the belly from a height, by means of a jug or tea-kettle. This should be done night and morning until the catheter is no longer required. Retention of the urine, from a weakened or paralyzed state of the bladder, may also arise from certain affections of the brain, or from injuries done to the spine by blows or otherwise. In the latter case, some degree of insensibility and weakness of the lower limbs is generally present. This form of the disorder is often symptomatic of particular diseases. It occurs sometimes in the course of fevers, painters' colic, dysentery, &c. In all such cases the state of the bladder should be carefully attended to, and the catheter employed at least three or four times in the course of twenty-four hours, until the patient recovers from the disease on which the retention depends.

Strangury sometimes arises from the internal administration of

Spanish flies (cantharides) or their external application in the form of blisters. In this case there is a sensation of fulness and weight at the region of the bladder, attended with frequent inclination to make water, smarting, heat, and difficulty in voiding it. These symptoms are soon relieved by drinking freely of linseed tea, barley water, decoction of marsh-mallow. In severe cases it will also be advisable to take forty or fifty drops of the *tincture of henbane*, in two ounces of camphor mixture, every four or six hours. These remedies are also very serviceable in relieving the strangury which attends gonorrhœa. In this last case much relief may also be derived from the immersion of the penis in warm water.

In extreme cases of retention of urine, when all other means have failed, it is the duty of the surgeon to withdraw the urine by puncturing the bladder, in order to prevent a fatal termination.

Persons subject to this disease should live abstemiously, and carefully guard against exposure to cold, sudden vicissitudes of temperature, wet feet, and every kind of severe bodily exercise; and, of all things, they should never neglect to attend instantly to a call to make water.

VACCINATION.

The improved method of treating small-pox by the free admission of fresh air into the patient's room, the avoiding of everything heating or stimulating, the use of cooling drinks, conjoined with other appropriate remedies, and the introduction of inoculation into England by Lady Mary Wortley Montague, in the year 1721, had greatly diminished the mortality from that loathsome and dangerous disease; but it was not until 1798 that the illustrious Jenner announced the fact, that the human system could be effectually and permanently secured from its influence by vaccination. In the course of two or three years from the time that this benefactor of his race began to promulgate his invaluable discovery—the most important recorded in the annals of medicine—the practice of vaccination had almost superseded inoculation throughout the kingdom, and is now known in the most remote countries in every quarter of the globe.

A tradition, which had long existed among the peasantry in different parts of England, led Dr. Jenner to observe that in the dairies of Gloucestershire the cows were subject to an eruption on their teats and udders, which was sometimes communicated to the hands of the persons engaged in milking them, and was attended in most instances by a slight degree of fever. He also observed that those who had undergone this disease, known under the name of cow-pox, were never afterwards liable to small-pox, either by inoculation or by exposure to the most active contagion. After carefully investigating the causes and effects of cow-pox, during a period of upwards of twenty years, he satisfied himself of the correctness of the fact, that vaccination produced such a change in the constitution as effectually to preserve it from the influence of the contagion of small-pox. He also maintained that both these diseases are essentially the same; and this has since been confirmed, both in England and in Germany, by experiments, which have clearly proved that the cow receives the small-pox by inoculation, and changes it into vaccine. This, if again introduced into the human body, produces the true cow-pox. He also established the identity of the cow-pox with the disorder called the *grease* in horses. It has since been ascertained that cow-pox may be communicated to man from the horse, without the agency of the cow; and it is now generally understood, contrary to the opinion entertained by Jenner, that the disease may originate in the cow without access to horses.

Children, if healthy, and their skin perfectly free from every kind of eruption, should be vaccinated before the process of teething commences. The most suitable age for the operation is about the fourth or fifth month after birth. The vaccine matter, or lymph, as it is commonly called, should be taken from the pock, or vesicle, between the fifth and eighth days; and, if circumstances admit, should be inserted in a recent state. It ought to be perfectly limpid and transparent. The operation is very simple. The operator having grasped the child's arm with a sufficient degree of firmness to keep the skin tight, should make two small oblique punctures, by means of a clean sharp lancet, charged with lymph. The punctures should be made merely below the scarf-skin, so as to place the matter on the surface of the true skin, from which absorption rapidly takes place. No blood should be drawn. A single *full* drop of blood is apt to dilute and wash away the matter inserted. A *particle* of blood usually follows the puncture, showing that it has reached the true skin, and does not interfere with the success of the operation. It will also be proper to charge the point of the lancet a second time with lymph, and wipe it upon the wounds. This precaution is particularly necessary, if the skin be unusually tough or the lancet blunt; circumstances which in the first instance may have prevented the matter from entering the wounds.

The effects of vaccination are thus accurately described by Mr. Bryce:—" About the third day after the insertion of the virus of cow-pox, either by puncture or by slight incision in the arm, a small inflamed spot may be observed in the part where the inoculation was performed. Next day this spot appears still more florid, especially if the person be warm; and by passing the point of the finger over it, a degree of hardness and swelling in the part is readily perceived. On the fifth day a small pale vesicle occupies the spot where the inflammation was, and the affection begins to assume the characteristic appearance of cow-pox. In place of inflammation extending round the base of the vesicle at this period, as is common in small-pox and most other pustular diseases, the whole has a milky-white appearance. The vesicle is now turgid, but evidently depressed in the centre, while the edges are considerably elevated. For the next two days, the vesicle increases in size, and retains the same character; so that by the seventh it has acquired very considerable magnitude, and is of a circular form if the inoculation was performed by a puncture, or of an oblong form if done by an incision; but in both cases the margin is regular and well defined; while the centre, becoming still more depressed, and a small crust forming there, and the edges becoming more turgid, give the whole a very particular appearance and character, which, in my opinion, may readily serve to distinguish this affection from every other.

"About the eighth day from the time of inoculation the glands in the armpit become a little swelled, occasioning pain and stiffness on moving the arm. Headache, shiverings, a frequent pulse, and other febrile symptoms take place; and these have been observed to continue from a few hours to two or more days. These symptoms, however, are in general so slight and transient as to require no aid from medicine."

The dark-colored scab becomes gradually detached, and drops off about the twenty-first day after the insertion of the lymph, leaving an indelible scar, which is of a circular shape, depressed, and indented with several small pits, corresponding to the number of cells of which the vesicle had been formed.

Sometimes, in consequence of a bad habit of body, certain conditions of the atmosphere, the use of impure lymph, or other causes with which we are unacquainted, vaccination is rendered imperfect, and does not run through the regular course above described. In such cases the part appears to fester, and is affected with a very troublesome itching. The pock, on the fifth day, is filled with opaque, straw-colored matter, which has no resemblance to the clear limpid fluid contained in the true cow-pox vesicle. The scab which afterwards covers the part is of a yellow color, and falls off on the tenth or twelfth day, sometimes earlier. The above are the usual appearances which result from imperfect vaccination; but severe inflammation, ulceration, the formation of scales, and other phenomena may be manifested; all of which may be easily distinguished from the uniform signs of cow-pox. When any of these irregular appearances occur, it is advisable to allow the parts to be perfectly healed before revaccinating the child.

REVACCINATION.

It is known by experience that a few persons—a small proportion—need to be *revaccinated.* Therefore it is advisable to renew the vaccination occasionally, especially *when exposed to an epidemic.* The operation may be repeated a number of times during the lifetime of an individual. It is certainly the safest course. No danger or pain attends the operation; and as it can do no harm and may save life, we should not hesitate to resort to it. Small-pox very very rarely attacks those who have been revaccinated. We should always consider, also, that the first vaccination may have been unsuccessful, through carelessness or bad luck in the operation.

VAGINISMUS.

The attention of the profession has been called to this disease but recently. It is a spasm of the vagina, resulting from an irritable condition of the part that makes sexual intercourse, and consequently conception, difficult or impossible.

This disease causes much domestic unhappiness, and sometimes undoubtedly leads to divorces. Those who suspect that they are afflicted with this nervous condition should at once consult their physician. By so doing they will save themselves much unhappiness. The disease is now regarded as perfectly curable. Various methods of treatment are employed for the dilatation of the vagina, and all of them are successful.

Patients who are afflicted with this peculiar malady are usually of a highly nervous organization, and in addition to the local treatment by the physician should also use every means to improve their general condition.

Barrenness or *sterility* is caused by this irritable condition of the vagina more frequently than is commonly supposed. I do not mean by this that it is the only or the principal cause of barrenness. Barrenness is a *result* of a great many diverse causes. It is oftentimes the result of causes which it is impossible to ascertain. Very frequently, however, it arises from some difficulty such as *vaginismus*, as I have above described it, which, under proper treatment, can be entirely removed. Sometimes it is the fault of the husband, and sometimes of the wife. It should not necessarily be made a ground of reproach against either party. It is frequently a misfortune that is to be borne, like all other earthly afflictions, with calm resignation.

The false delicacy which prevents many from consulting their medical adviser for diseases of the sexual organs is not only absurd, but in many cases is in the highest degree sinful. (See *Women, Diseases of.*)

VARICOSE VEINS AND ULCERS.

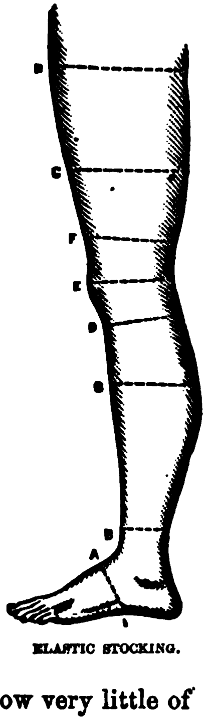
A varicose vein is generally of a blue color, sometimes of a brownish hue, is considerably increased in size, appears knotted, irregular, and winds in a serpentine manner beneath, the skin. Sometimes several veins enlarge in this manner within a small space, and appear coiled up, or, as it were, interlaced with each other, so as to form an irregular dark blue-colored tumor under the skin. In other cases the enlargement or dilatation is partial; and round, circumscribed, elastic swellings or knots appear at irregular distances along the course of a vein. Varicose veins increase in size when the individual is engaged in any active exercise, or continues long on his feet; whereas, on the other hand, repose, the horizontal position, and pressure cause them to diminish, or disappear altogether.

All veins are not equally liable to this disease; those which are deeply seated in the limbs or in the internal parts of the body very seldom become varicose; this morbid alteration of structure is, on the contrary, very common in the veins situated immediately under the skin. The superficial veins of the legs and thighs are most subject to this disorder. Those on the fore-part of the abdomen and about the *scrotum* are not unfrequently affected; but it seldom attacks the veins of the arms. When the veins about the lower part of the rectum and anus become varicose, the disease is then called piles.

At the commencement of the disorder, one or more veins, commonly one of the lower extremities, sometimes of both, are observed to be larger than natural, but not attended with pain or any inconvenience. The dilatation and change of structure of the vessels advance very slowly. A year or two, or even a much longer period, may elapse before the patient is induced to pay particular attention to the disease. At length he observes, after walking or remaining long on his feet, that the veins become considerably distended, while the skin over them feels hotter than natural. Resting in the recumbent position soon removes these symptoms, but they are readily brought on again by the same causes. The veins being frequently distended in this manner, at last become permanently dilated, acquire a tortuous appearance, and roll under the skin. As the disease advances, the patient, after any active exercise, experiences a painful sensation of tension in the dilated veins, accompanied with numbness, swelling, and perhaps shooting pains in the limb, which may render him for a time incapable of walking. These symptoms are always aggravated towards night, and again diminished in the morning.

Nature alone sometimes subdues and expels this disease. In other cases again it continues to get worse, and occasions disorders of the limb of the most serious nature. But in the majority of cases it remains almost stationary; and, although it may give rise to considerable pain at times, is rather to be considered as an inconvenient and troublesome affection than important or dangerous.

The accidents to which this disorder may give rise are loss of blood from perforation or rupture of the veins, the formation of painful ulcers over the affected parts, and sometimes inflammation of the veins.



ELASTIC STOCKING.

Treatment.—We know very little of the nature and causes of varicose veins, and are equally ignorant of any effectual method of curing them; but it has, nevertheless, been proved by experience that we have it greatly in our power to retard the progress of this affection, to alleviate the pain, and to reduce the swelling by a properly-regulated and permanent compression. For this purpose a laced stocking is generally employed; and this, with rest in the horizontal position, are the grand means of palliating the disorder.

When the veins or the adjacent parts become inflamed and painful, *leeches* should be employed, and *vinegar and water*, *Goulard water*, or any other cold lotion, ought to be constantly applied to the parts. Sometimes cold applications do no good; in such cases, bathing the part with a warm *decoction of poppy-heads*, or warm water with laudanum, will be found serviceable, and more agreeable to the feelings of the patient. The bowels should be freely opened by means of *calomel* and *jalap*, followed by *Seidlitz powders*, *Epsom salts*, or any other cooling saline purgatives. Low diet and quietude in the recumbent position are to be strictly enjoined until the inflammation be entirely subdued.

The treatment is the same as for other ulcers. (See *Ulcers*.)

VERATRUM VIRIDE (AMERICAN HELLEBORE).

This grows in all parts of the United States. The remedy is used in *lung fever*, acute *rheumatism*, and in some other affections. Its effect is to *reduce the pulse.* The dose of the tincture which is chiefly used is from *one to eight drops.* The remedy is a powerful one, and is not adapted for domestic use.

VERTIGO, OR DIZZINESS.

This is a symptom of a large variety of nervous conditions. It sometimes indicates some serious disease, and sometimes is a mere occasional and temporary annoyance.

There are persons who are subject to attacks of vertigo. They become giddy, and reel like one intoxicated. Their vision becomes blurred, there is sickness at the stomach. These attacks may last a moment or two, or several hours.

Vertigo may be caused by anything that injures the nervous system—excessive mental labor, abuse of the appetites, loss of sleep, anxiety—all causes and combination of causes that bring on dyspepsia, constipation, nervous exhaustion, and other nervous diseases. (See *Nervous Diseases.*)

Vertigo often causes unnecessary alarm. Patients who are sub ject to the attack fear that it may lead to something worse. They fear lest it may lead to apoplexy, epilepsy, or insanity. This fear, though very natural, is, *as a general rule, unfounded.* In the majority of cases, patients who suffer from apoplexy, epilepsy, and paralysis do *not* have these attacks of vertigo before the attack.

Frequently those who for years have been subject to attacks of vertigo, die of some disease that has no connection with the brain.

There is no specific treatment for vertigo. The treatment, hygienic and medical, is precisely the treatment for nervous diseases in general. (See *Nervous Diseases, Treatment of.*)

VOMITING OF BLOOD.

Vomiting of blood sometimes takes place in consequence of a blow on the stomach, from riding a rough-trotting horse, from strong mental excitement, or other accidental causes; but in general it arises from disorders of internal organs.

In malignant diseases of a putrid character, where the blood itself is diseased, as in small-pox and malignant or putrid fevers, in which dark-colored spots appear in the skin, vomiting of blood is a symptom which indicates extreme danger, and is generally to be considered as the forerunner of death.

In warm climates, vomiting of blood not unfrequently occurs from an obstruction in the liver or enlargement of the spleen. It sometimes proceeds from constipation of the bowels, or may be caused by a simple or a cancerous ulcer in the stomach; it occasionally arises in young unmarried women, in consequence of suppression or diminution of the menstrual discharge, and in the latter case is more alarming in appearance than really dangerous. The danger principally proceeds from the source in which the hemorrhage originates.

It is of importance, in every case, to ascertain whether the blood is discharged from the stomach or from the lungs. In the *former* case, the vomiting is usually preceded by a sensation of weight, anxiety, and sometimes pain at the pit of the stomach; is not accompanied by cough, or any uneasiness about the chest; the blood is usually in considerable quantity, of a dark color, not frothy, and mixed in most cases with portions of food. When the discharge proceeds *from the lungs*, the blood is generally in smaller quantity, of a brighter red color, frothy, and not mixed with the contents of the stomach; a feeling of heat or other symptoms of uneasiness are felt at the chest; and the patient in most cases has been previously affected with cough, or has shown other symptoms of a disordered state of the lungs. Hemorrhage from the lungs is always a more formidable symptom than when it proceeds from the stomach, inasmuch as in the former case it is generally a symptom of pulmonary consumption. (See *Spitting of Blood.*)

Treatment.—In the great majority of cases, vomiting of blood from the stomach is merely symptomatic, and not a disease in itself; our remedies are therefore to be directed to remove the disorder on which it depends. If it arise from derangement of the menstrual function, the reader will find the necessary instructions in their proper place. If it proceed from constipation of the bowels, the treatment will be found under that head. In warm climates enlargement of the spleen sometimes takes place suddenly from congestion of blood, and gives rise to hemorrhage from the stomach.

In every case it is advisable to give the patient cold drink—spring water—*iced water*, if it can be procured—or an *infusion of tamarinds.* Bodily and mental quietude are absolutely necessary; and the diet for some time should be of the very lightest quality, and in small quantities. The *oil of turpentine*, in doses of twenty to thirty drops in cold water, every four or six hours, has been employed successfully to arrest the vomiting. It will be necessary to give brandy, in small quantities, at short intervals, if the patient be much exhausted.

VOMITING, OR REGURGITATION.

Sometimes the habit of vomiting becomes so persistent as to deserve to be called a special disease. It is frequently a symptom of a large variety of diseases, and especially of dyspepsia and of inflammation of the stomach. (See *Dyspepsia; and Stomach, Inflammation of.*)

The form of which I speak here is rather a nervous disease, not depending on any inflammation. It seems oftentimes to be an affection of the *pneumogastric nerve* that supplies the stomach.

When a patient is troubled with obstinate and persistent vomiting, all that we can do is to try in succession the following remedies, until we hit on the one that meets the case:

1. Oxalate of cerium, in doses of from one to three grains.
2. Bromide of potassium, in doses of from five to fifty grains in water.
3. Subnitrate of bismuth, in doses of from five grains to half a drachm.
4. Electrization, general or localized. (See *General Electrization* and *Localized Electrization.*) The disadvantage of this very

excellent method of treatment is that very few are situated so that they can avail themselves of it.

5. Creosote, in doses of one, two, or three drops in water.

The diet should be carefully studied. Each case is a law unto itself. I have at the present time under treatment a patient whom, at one stage of his illness, a piece of cracker would apparently injure, but who could at the same time eat a hard boiled egg with impunity.

WARTS.

The excrescences from the skin called warts may appear on any part of the body, but they occur most frequently on the hands.

Warts have sometimes narrow necks, more frequently broad bases; they may be quite superficial, or attached to the parts beneath by roots; their surface is smooth, or rough and fissured; and they are not in general painful, unless when bruised or otherwise injured. The popular opinion that warts may be propagated by the blood, which they sometimes discharge when rubbed or roughly touched, is incorrect; but it appears probable that the matter secreted by soft warts is capable of producing a similar affection in other persons.

Treatment.—Warts frequently disappear without treatment, but in many cases they increase in size, become troublesome, and require to be removed. Pass a pin through the wart. Apply one end of the pin to the flame of a lamp; hold it there until the wart *fries* under the action of the heat. A wart so treated will take final leave. This method of treatment is warmly recommended. The best method of removing hard warts is to cut them off with a knife or scissors, and then apply caustic to destroy their roots. These excrescences may be destroyed by touching them repeatedly with *lunar caustic*, *blue vitriol*, or *nitric acid;* or they may be effectually removed by the application of the *chloride of zinc.* A wart with a narrow neck may be easily destroyed by fastening round it a silk thread or a horse-hair. After it drops off the roots should be touched with caustic, to prevent it from growing again. A good application for destroying warts about the anus or genital organs is a powder composed of equal parts of the powder of *savine-leaves* and *verdigris.*

WATER CURE, OR HYDROPATHY.

Water has been used in the treatment of disease from the earliest times. By the example and influence of Priessnitz, the system called hydropathy was established in Germany. This system consisted in using water as an *exclusive* method of treatment for nearly all diseases.

Hydropathy has been, is now, and always will be more or less successful in a variety of diseases. *All good physicians make a greater or less use of water in the prevention and treatment of disease; but no good physician depends on water for the treatment of all or the majority of diseases.*

Some of the processes of the water cure are decidedly beneficial in many diseased conditions; others are severe, violent, are adapted but for a few, and in many instances have done great harm.

Among the processes of hydropathy I may mention the following:

RUBBING WET SHEET.

A coarse sheet of linen or cotton, wet, and wrung out more or less, is thrown over the patient's body. The assistant then rubs the patient over the sheet from two to five minutes, until the surface of the body becomes warm.

The shock of the wet sheet is at first disagreeable; but in many cases the effects are most agreeable.

SHOWER BATH.

This is a powerful tonic, but it must be used with caution. There are many—very many—who cannot use the shower bath. Some persons who are quite strong cannot endure the shock. For others, it is a most agreeable and beneficial luxury. Each case must be studied by itself.

WET-SHEET PACK.

A linen or cotton cloth is wet and wrung out, is spread on a bed which has previously been prepared by removing the usual clothing, and placing on it some flannels and comforters. The patient, undressed, lies down on the sheet. The sheet is wrapped closely about his body, and over all are folded the flannels and comfortables. The patient remains in the pack from ten to twenty minutes. To some patients the sensations of these packs are delightful. Like all the processes of the water cure it should be used with caution.

SITZ BATH.

In this process the patient sits in a tub, in which there is sufficient water to cover the hips, from five to twenty-five or thirty minutes.

WET BANDAGES AND COMPRESSES.

These can be used by every family. A piece of linen or cotton may be wet and wrung out, and placed over the stomach or bowels, and *over this* may be placed a piece of flannel or oiled silk. The cloth may be kept in place by tapes or pins. I have found this treatment to afford great relief in *dyspepsia.*

A wet compress may be placed about the neck in the same way in sore throat. *Spongio-piline* is a good form of compress. (See *Spongio-piline.*)

DOUCHES.

A douche is a stream of water that falls from a certain height upon any part of the body. For domestic use the common pump or spout will afford a fall of a few inches, that may be sufficient in the treatment of *sprains.* Another way of using the douche is for the attendant to stand on a chair and pour water from a pitcher or pail on the part desired to be affected.

DIFFERENT FORMS OF BATHS.

The *cold bath* is a tonic. Like other tonics it must be used with caution, and with the limitations that have already been described. Many cannot use it at all. The *tepid and warm bath* is slightly tonic and sedative; it induces sleep. It is well to take tepid or warm baths before retiring. Tepid and warm baths relax the skin and predispose *to taking cold.* They should not, therefore, be taken in the morning (except when they are followed by a cold bath), but rather after the exposure of the day is over.

Hot baths are debilitating when they are used for any length of time. It is rarely beneficial to take hot baths unless they are followed at once by the toning influence of cold affusions or showers. (See *Turkish and Russian Baths* under *Hygiene.*) *Local* applications of *hot water* are frequently of great benefit.

SEA-BATHING.

This is a method of employing water that, in a vast number of cases, is as beneficial as it is agreeable. It will not, however, answer for all.

It is well for invalids to take medical advice before taking a course of sea-bathing. The feeble should always begin cautiously. A course of sea-bathing acts beneficially in these ways:

1. *By the direct tonic effects of the water*, when directed with force against the body. Fresh water in the form of the shower bath or the *douche* is also a powerful tonic.

2. *By the absorption of the salts of the sea.* These salts are really medicinal in their characters.

3. *By the air of the sea.* Sea air is impregnated with minute quantities of saline ingredients. These are continually breathed into the lungs, and influence the general system. Sea air is not always beneficial to consumptives. (See *Pulmonary Consumption.*)

4. *By the rest and sleep which are enjoyed by the sea-side.*

The air of the sea acts upon many like an agreeable anodyne. It induces sleep. Sleep is food. It is the food which over-tired brain-workers especially need.

Some persons are made sick by sea air. As soon as they visit the shore they are troubled with nausea, indigestion, and headache.

Mountain air should be sought by those who are not benefited by a residence on the shore. Mountain air is a powerful stimulating tonic. It is rarely injurious, except to those whose lungs are exceedingly weak.

WATERS, MINERAL AND MEDICINAL.

The opinion of the physician is very frequently asked concerning the various springs, baths, and waters that are so much lauded in advertisements.

Without specifying any particular name I may make a general reply to the query in this way:

1. *All of these waters really or apparently benefit some of those who try them.*

If a thousand patients afflicted with a variety of diseases were to visit some advertised and highly lauded spring that should contain nothing but pure distilled water, unquestionably more or less would be apparently benefited, and some would probably become enthusiastic.

2. *All of these are overrated.* Patients expect too much of them. Advertisements claim more than is true. Those who have been benefited are apt to look only at the successes, forgetting entirely the failures.

3. *Some of these waters are beneficial for some diseases, but none of them will cure everything.*

My opinion is often asked concerning *electric baths.*

I usually reply that bathing in general is beneficial, and that electricity is a remedial agent of remarkable efficacy, but the effects of the electricity when administered through water in the form of baths must be very slight indeed. The currents become diffused through the water, and are not sufficiently concentrated in any one part to be of much service. I have no doubt that some are really benefited by electric baths, but I should attribute such benefit as much to the effects of the water as to the effects of the electricity.

By these remarks I do not wish to be understood as condemning all our mineral springs, iron springs, sulphur baths, hot springs, our Vichy, Kissingen, Saratoga, and other waters; on the contrary I believe that benefit is often derived from them. I wish both to moderate the enthusiasm of those who happen to receive assistance from any of these waters, and to encourage those who have no faith in them. Those who labor under incurable disease are oftentimes justified in trying anything and everything that offers even a shadow of hope, except to encourage villany and charlatanism. Those who have gone the round of all these springs, after trying other means of cure unsuccessfully, have at least the consolation that they have left no means untried.

WHITES, OR LEUCORRHŒA.

The mucous membrane of the *vagina* and womb, in the healthy condition of the parts, is always kept moist by its own secretion; but from various general or local causes, this mucous fluid, which is only intended to lubricate the parts, is often secreted in too great abundance, and runs from the vagina. But the discharge, far from being always white, as the vulgar term applied to the disease would lead us to suppose, presents various shades of color. At first it is transparent, glutinous, resembles the white of eggs, and is not very copious; but in the more protracted cases becomes thin, watery, or appears slightly milky, opaque, and is freely discharged. This disorder is not accompanied with pain, except occasionally in the loins, when the patient is fatigued; but never continues long without producing more or less derangement of the general health. In many cases the menstrual discharge is too profuse, irregular, or altogether obstructed; and although the patient may be robust, and present the general appearance of good health for a considerable length of time, yet at last she becomes pale, and at times haggard. The eyes lose their natural brilliancy, and the lips their color. The feet and hands are often cold; the bowels are frequently constipated; she complains of general languor, and labors under the usual symptoms of indigestion; and not unfrequently the disorder is complicated with hysteria or chlorosis. (See *Green-sickness.*) In some patients the discharge is slight, and not constant, being only observed for some time after each menstrual period; in others, again, it is so profuse, that pieces of linen require to be constantly order to prevent the fluid from running down the thighs; and, without the greatest attention to cleanliness, irritation or excoriation of the adjacent parts is induced. When it exists to this extent, the parts are often much relaxed; and sometimes there is considerable prolapsus, or falling down of the womb; but there is neither pain, heat, nor swelling, and the discharge is without smell. The term Whites is generally understood to apply only to the disease as above described, which is wholly unconnected with inflammatory action, and arises from debilitating causes—such as poor, watery, and deficient diet, living in the confined and impure air of large towns, or in damp, obscure, and ill-ventilated situations, and light or imperfect clothing; hence the lower classes of females in the country, who wear worsted stockings and woollen under-garments, are very rarely affected with this disorder. It may also arise from trouble of mind, indigestion, obstructed or excessive menstruation, chlorosis, &c.

But females are also very subject to discharges from the genital organs of an inflammatory nature, resulting from various irritating or exciting causes—such as the use of rich stimulating food and drink; violent exercises, as dancing and riding on horseback; excessive sexual indulgence, improper habits, and irritation of the parts, in whatever manner produced; exposure to cold, difficult labor, an acrid state of the *lochia* or cleansings, worms, piles, &c. This form of the disease, when acute, cannot be distinguished from gonorrhœa; the symptoms are the same. The patient complains of a feeling of tension of the parts, heat, pain, &c. (See *Gonorrhœa.*) The discharge at first is milky, then of a dark yellowish appearance, and afterwards changes to a greenish color; or there may be from the first a discharge of a glairy secretion resembling the white of eggs; this last indicates that the neck of the womb is affected. If the disorder terminate favorably, the discharge begins to diminish from the tenth to the twentieth day, and gradually assumes the appearance described in the first form of the disease, and at length ceases entirely; or it may become chronic, and then a more or less thick discharge, of various colors, is voided, which may continue during an indefinite period. In some cases the secretion is devoid of smell; in others again it is more or less fetid. This variety of the disease may be characterized by symptoms of a much milder description; the degree of severity must, of course, depend upon the intensity of the cause, the constitution of the patient, and other circumstances.

Treatment.—The treatment of leucorrhœa must depend greatly on the cause of the disorder. The indiscriminate use of cold water or of strong astringent injections will do more harm than good.

Much benefit will often result from the use, by means of a Davidson's rubber syringe, of water, as hot as it can be borne. The injection should be kept up for at least fifteen minutes, and used twice a day. The addition of a drachm of common salt to each pint of water used will often prove serviceable, and in more obstinate cases half the quantity of alum may be substituted for the salt. At least a gallon of hot water should be used at each injection, and the water alone ought to be thoroughly tried for several days before resorting to the salt or alum. This treatment is particularly applicable to cases in which the discharge is white and creamy. Where there is a greenish or a clear, glairy discharge, there is reason to suspect some disease of the womb demanding special treatment. In all cases of leucorrhœa the general condition of the patient must be attended to. Tonics, as the various preparations of iron and quinine, are very often of as much importance as local treatment. Constipation of the bowels must be obviated, but the habitual use of purgatives cannot be too strongly condemned. Much benefit will be derived from sponging the abdomen and loins every morning with cold salt-and-water, and afterwards rubbing them with a coarse towel until the skin is flushed and warm.

The use of the hot water, as already directed, should be continued for several weeks after the discharge has been checked, else the trouble may return; but it may be sufficient to take one thorough injection daily, instead of two, as at first.

When a careful use of the simple means recommended, including tonics and good, nourishing diet, fails to cure or relieve the leucorrhœa, it will be the duty of the sufferer to consult some physician, and follow his advice.

WHITLOW, OR FELON.

Whitlow is well known to be an inflammatory and exceedingly painful affection of one of the fingers or thumbs, sometimes of one of the toes, generally terminating in the formation of matter. There are three kinds of whitlow, varying in severity, according to the part of the finger in which the inflammation is seated.

In the *first form* of whitlow the inflammation is confined to the surface of the skin at the point of the finger; sometimes it extends round the base of the nail. In the *second form* the inflammation is seated in the cellular substance under the skin. In the *third form* the disease attacks the membrane which covers the bone at the extremity of the finger; and in severe cases extends upwards to the fibrous sheath which binds down and retains the tendons in their position. But it must be kept in mind that these three varieties of the disease are only to be recognized at their commencement, or in mild cases; for it often happens that the inflammation is at first superficial, and afterwards extends to the more deep-seated parts; or it commences in the membranous structures near the bone, and extends outwards. In severe cases, the whole organization of the finger is involved; and if the disorder be improperly treated, the bone is destroyed, and one or two of the joints may be lost, or rendered rigid and useless.

The *first*, which is much the mildest form of the complaint, usually arises from a prick or slight bruise of the finger, particularly when the injury is inflicted at the root of the nail.

The pain at the commencement is slight, and accompanied with a sensation of itching; the part soon becomes slightly swollen, red, and shining, while a feeling of throbbing is experienced at the point of the finger. After twenty-four or forty-eight hours—sometimes not until the expiration of three or four days—the scarf-skin or cuticle rises from the true skin, so as to form a vesicle filled with a turbid, reddish, or yellowish-colored fluid, which may be situated at the end of the finger or at the root of the nail; and then the pain, which had gradually become very distressing, and even so severe as to prevent the patient from sleeping, is much abated.

When the vesicle bursts and the serous fluid is discharged, the true skin appears, covered with a thin layer of yellowish-colored matter; or it is slightly ulcerated, or even perforated, so as to communicate with the cellular substance beneath. (See *Erysipelas.*) If at the commencement the whole of the inflamed part and some distance round it be gently touched with lunar caustic, the disorder may be very quickly and completely arrested in its progress. But if this method of treatment be not resorted to at an early stage of the inflammation, or if it be employed without producing the desired effect, it will then be proper to apply warm poultices of linseed or bread, moistened with laudanum, until a vesicle, as above described, makes it appearance. This should be punctured early with a lancet, or sharp pen-knife, or cut open with scissors, in order to allow the matter to escape. The poultices are to be continued for two or three days, and afterwards common *cerate*, or any simple dressing, may be applied. Under this treatment the ulcerated part readily heals, new scarf-skin forms over it, and the finger soon assumes its natural appearance. In some instances matter forms under the nail, which is detached in consequence, and falls off; but this loss is supplied, after a time, by the formation of a new nail.

In the *second* form of the disease, or that in which the inflammaject to the attack fear that it may lead to something worse. They fear lest it may lead to apoplexy, epilepsy, or insanity. This fear, though very natural, is, *as a general rule*, *unfounded.* In the majority of cases, patients who suffer from apoplexy, epilepsy, and paralysis do *not* have these attacks of vertigo before the attack.

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In malignant diseases of a putrid character, where the blood itself is diseased, as in small-pox and malignant or putrid fevers, in which dark-colored spots appear in the skin, vomiting of blood is a symptom which indicates extreme danger, and is generally to be considered as the forerunner of death.

In warm climates, vomiting of blood not unfrequently occurs from an obstruction in the liver or enlargement of the spleen. It sometimes proceeds from constipation of the bowels, or may be caused by a simple or a cancerous ulcer in the stomach; it occasionally arises in young unmarried women, in consequence of suppression or diminution of the menstrual discharge, and in the latter case is more alarming in appearance than really dangerous. The danger principally proceeds from the source in which the hemorrhage originates.

It is of importance, in every case, to ascertain whether the blood is discharged from the stomach or from the lungs. In the *former* case, the vomiting is usually preceded by a sensation of weight, anxiety, and sometimes pain at the pit of the stomach; is not accompanied by cough, or any uneasiness about the chest; the blood is usually in considerable quantity, of a dark color, not frothy, and mixed in most cases with portions of food. When the discharge proceeds *from the lungs*, the blood is generally in smaller quantity, of a brighter red color, frothy, and not mixed with the contents of the stomach; a feeling of heat or other symptoms of uneasiness are felt at the chest; and the patient in most cases has been previously affected with cough, or has shown other symptoms of a disordered no kind of bodily suffering which equals this in intensity; and the acute pain gives an intimation of the nature of the disorder, which is not to be mistaken. *Making an incision, as already directed, is indeed the only measure on which much reliance can be placed.* To be of service, this should be done *early*, because, if the smallest quantity of matter be thrown out from the membrane of the last bone of the finger, or be pent up within the sheaths of the tendons, which rest upon the second and third bones, the pain becomes so excruciating that high fever is produced, to sleep is impossible, and the patient may even become delirious or be seized with convulsions. Not only the finger, but the hand and wrist also become swollen; the pain extends to the elbow, and even to the shoulder, and, if vent be not given to the matter, it spreads among the tendons, and may even accumulate in the palm of the hand, while the finger-bones become diseased, and are destroyed. If under such circumstances the patient escape with the loss of one joint, he may consider himself fortunate. If the last joint of the finger be chiefly affected, the incision should be made as already directed; but if the pain and inflammation be seated higher up, the cut should be made at one side of the finger; and care should be taken to carry it down to the bone, whether it be required at the point of the finger, or higher up near the hand. The subsequent treatment is the same as in the preceding case.

DISEASES OF WOMEN.

In no single department of medical science has greater progress been made within the last twenty years than in that pertaining to diseases of women—by which we mean those maladies peculiar to woman by virtue of her sex. These manifold diseases and derangements are now better understood and more intelligently treated than at any former period in the history of medicine. This advance is due in a great measure to the invention and application of improved means of investigation, enabling the practitioner easily to distinguish between various diseases having complicated or somewhat similar symptoms.

The study of these diseases has doubtless been stimulated by their extraordinary prevalence among all classes of society and in all civilized countries. It is undoubtedly true that among American women robust health is the rare exception, and disease, of some form implicating the uterine system, the general rule. It would be a long and laborious task to investigate in detail the numerous causes that conspire to render our women the subjects of so many distressing maladies. Vast numbers of children are born with the germ of disease, that may remain latent during childhood to be developed in early womanhood. But supposing a child to be ushered into lift with a fair constitution, and to pass safely through the dangers incident to childhood, there begins for the girl a new series of dangers from the very first occurrence of menstruation. Carelessness, exposure, or improper management at that critical age may lay the foundations of life-long trouble. Hence the necessity at that period of maternal care and watchfulness, aided by an intelligent appreciation of the perils to be avoided.

Young women should be early instructed in the care of their own health, with particular reference to disorders of menstruation, since nothing is more common than serious and painful disease solely attributable to exposure, as to cold or wet, through carelessness, or ignorance of the dangerous consequences.

Keeping the feet always warm and dry would of itself prevent an incalculable amount of disease among young women, both married and single. But the simplest preventive measures are constantly neglected, at the expense of health and comfort. It seems almost superfluous to explain to women the many evils that result from tight-lacing, but the reality and frequency of disease due to that cause are well known to every practitioner of any experience in the diseases of females. By this unnatural compression of the body not only are the lungs injuriously compressed, but all the organs below the waist are crowded down, and the womb must ultimately suffer from the violence to which it is subjected. The circulation, too, is necessarily deranged, and it would be altogether unreasonable to expect a healthy performance of the uterine functions under such circumstances.

Errors in diet, by deranging the general health, indirectly produce or aggravate many uterine diseases.

The abuse of purgatives, especially of the popular quack medicines, is one of the abominations against which women cannot be too emphatically cautioned. Nearly all the pills lauded as remedies for constipation are composed of the cheapest aloes and other purgatives, and their habitual use leads to a morbid condition of the bowels, and consequent uterine disturbance.

Married women are liable to a multitude of diseases, hinging, as does the whole active life of woman, on the organs designed for the perpetuation of the species.

In very early marriages the chances of inflammatory uterine affections are greatly increased, and the danger of miscarriages is also greater than when the organs are mature. Miscarriages at any age are often followed by a long train of evils, many of which might be avoided if it were thoroughly understood that *more care* is necessary after a miscarriage than after a natural labor. Excessive matrimonial indulgence is often a cause of inflammation of the womb, especially if there be any previous displacement.

Displacement of the womb, either backward or forward, is a common affection, and occurs both in married and single women. Recent cases of displacement can generally be treated with success, but old cases, complicated with inflammation or its results, are often very troublesome and tedious. Falling of the womb is a disorder often capable of cure, and almost always of relief. Tumors of various kinds form upon and around the womb, and demand skilled treatment for their relief. Polypus is a growth generally within the uterus, and commonly first suspected on account of a frequent and profuse discharge of blood. Fistulous openings between the vagina and the bladder or rectum may now be cured with tolerable certainty by a surgical operation. Indeed, so numerous are the ills to which woman is heir, that we have not space even to name them all. It is gratifying, however, to know that they are not now less amenable to treatment than diseases in general. It must be acknowledged that to woman herself is due a large share of the success that attends the management of her diseases at the present day, and every conscientious physician must honor the courage that leads suffering women, for the sake of health, to submit with patience and confidence to means of treatment from which they were formerly debarred by mistaken delicacy and an inconsiderate public opinion. There can be no doubt in the mind of any afflicted woman, that it is her duty, at almost any sacrifice, to recover and preserve her health, since upon that blessing commonly depend the happiness and welfare of an entire family.

The speculum of Dr. J. Marion Sims, and its modifications (see *Specula*), is to uterine practice what the ophthalmoscope is in diseases of the eye; it has brought about a revolution in this field of medicine, and is to-day one of the simplest and most valuable surgical instruments in use. The patient is placed on the left side, and, without causing pain or exposure, the experienced practitioner in uterine diseases is enabled to *see* the uterus, gauge its size, judge accurately of its position, observe the condition of the surrounding organs, and make any necessary applications with as much ease and nicety as if any external part were the subject of treatment. Many other instruments are used in connection with the speculum, but most of them depend almost entirely upon it for their utility. Like all other useful instruments, the speculum is of course liable to abuse, but in the hands of the judicious and experienced practitioner its benefits can hardly be over-estimated.

WORMS.

The production and development of worms in the body is one of the most remarkable facts in connection with disease. They are

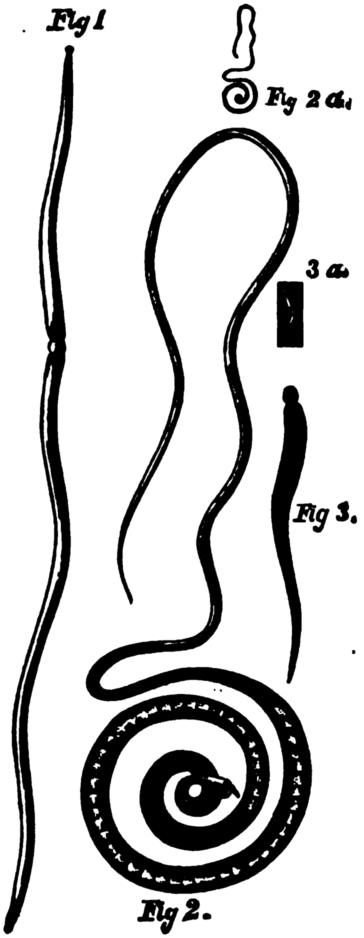


Fig 1
Fig 2 a.
3 a.
Fig 3.
Fig 2.

Fig. 1.—The Round-worm, natural size.
" 2.—The Long Thread-worm, magnified. Fig. 2 a.—The Long Thread-worm, natural size.
" 3.—The Short Thread-worm, magnified. " 3 a.—The Short Thread-worm, natural size.

found most frequently in the intestinal canal, but have been observed in the bladder, kidneys, liver, brain, and eyes; indeed, there is scarcely an organ or structure of the body in which they are not occasionally seen. The body is infested with about thirty different kinds of worms. I shall speak here only of the round-worm, thread-worm, tape-worm, and the *trichina spiralis* found in the muscles.

The general symptoms which indicate the presence of worms in the bowels are the following: The face is pale, there is a bluish or livid-colored circle round the eyes, the countenance frequently changes color, the appetite is variable and capricious, sometimes voracious. There is itching of the nostrils and of the anus, disturbed sleep, and grinding of the teeth; the belly is swollen, though not hard; the stools are slimy and irregular, and griping pains are sometimes felt in the belly. It must be confessed that all of these symptoms are uncertain. The only reliable symptom is to *see* worms after the child has passed them.

The *round-worm* varies from six to ten inches in length, is usually found in the small intestines, and resembles the common earth-worm in its general appearance; it chiefly infests the bowels of children, sickly persons, and those who are badly fed. The particular symptoms which lead us to suspect the presence of this species of worms are swelling of the abdomen, and sharp or colicky pains felt occasionally in different parts of it, more especially about the navel; slimy evacuations from the bowels, and a disagreeable breath.

The *thread-worm* or *maw-worm* is from a quarter to half an inch in length, and is usually seated in the rectum or lower bowel. It is remarkable for the quickness of its movements. People of all ages are liable to be troubled with worms of this description; but they are more common in the bowels of children than in those of adults, or persons advanced in life. The particular symptoms occasioned by thread-worms are itching about the fundament, which is often very distressing when the patient is warm in bed; occasional scalding or difficulty in voiding the urine, a bearing-down sensation at the lower bowel, an oozing of slimy matter from the fundament, irritability of temper, and sometimes great depression of spirits. This and also the round-worm occasionally crawl out of the anus during the night.

The *tape-worm* is composed of numerous pieces united by joints, and is generally an inmate of the small intestines, where it lives on the chyle or milky juice which is intended to nourish the body. It is seldom less than several feet in length, and is frequently discharged in pieces four or five yards long. In some instances it has been known to measure upwards of fifty feet. The tape-worm is more common in adults, particularly females, than in children. It is often found alone. Hence the term *tænia solium.* Itching about the nostrils and anus, pain in the belly, and colic more or less severe, occurring occasionally, are signs which may lead us to suspect the existence of tape-worm ; but there is no unequivocal symptom by which the presence of this worm in the bowels can be ascertained.

For the round-worms and thread-worms the following course of treatment will usually be effectual:

1. Give of the infusion of *senna* and *pink-root* (half an ounce of each to a pint of water), a tablespoonful before breakfast. The dose may be increased or diminished according to the age of the patient. This remedy is much used by the profession and by the people.

2. Give *santonine.* (For doses see *Santonine.*) This medicine requires care in using it. It may produce unpleasant symptoms. One-half or one-quarter of a grain is a sufficiently large dose for a child to begin. This dose may, of course, be modified by the age. Three or four grains of santonine may be mixed with cacao butter, and put into the rectum every night.

3. Give oil of turpentine in doses from one to four teaspoonfuls. This is a very effectual remedy. This is also a good remedy for tape-worm.

4. Give pumpkin seeds, made into a paste, in large quantities, and on an empty stomach. Among other familiar remedies I may mention *cowhage*, *calomel*, *powder of tin*, &c.

Turpentine may be given to children with perfect safety in the dose of a dessert-spoonful along with half a cupful or more of milk, linseed tea, gruel, or any other demulcent drink. The best time to take it is in the morning, about half an hour before breakfast; but if it produces much sickness of stomach or vomiting, the next dose should be given the following forenoon about two hours after breakfast. The dose must be repeated daily for three or four days or a week, a dose of castor oil (a dessert-spoonful or more, according to the age) being given every second day with the turpentine, until all the worms are expelled. The internal use of oil of turpentine is attended with no risk whatever; even in large doses it either passes off by the bowels or is vomited up without doing any harm.

In the West Indies the remedy generally employed is *cow-itch*, which seldom fails in effectually clearing the bowels of this species of worms.

When *tape-worm* occurs in adults, which is generally the case, *the turpentine* must be given in sufficiently large doses to act as a purgative ; or it should be given with castor-oil, in order to ensure its speedy expulsion from the bowels. The usual dose is a table spoonful or half an ounce, in conjunction with the same quantity of castor-oil, or twice the quantity of olive oil, which may be taken floating on milk, or on cinnamon or peppermint water. It may be necessary to increase the dose to two or three tablespoonfuls, and in all cases the remedy should be given every second day until the worm be expelled.

Pumpkin seeds, *petroleum* in doses of twenty to thirty drops, *oil of male fern* in doses of a drachm or two, and kousso, in half-ounce doses—all are good remedies against tape-worm.

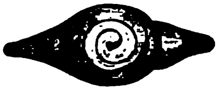
Worms, by the irritation which they produce, and the disorder which they occasion by drawing their sustenance from the juices intended to nourish the body, exercise over all the vital functions, and even over the intellectual faculties in some instances, a more or less injurious influence, which is felt throughout the whole animal economy, and may give rise to diseases of a formidable and even dangerous character, such as epilepsy, St. Vitus's dance, catalepsy, hysteria, somnambulism, and other obscure nervous affections. Hence, in all these disorders, when no other cause can be traced, we have reason to suspect the existence of worms in the bowels, even though none of the ordinary symptoms by which they are manifested be present. In many cases the remedies usually administered with the intention of destroying worms have been the means of curing diseases which have obstinately resisted all other methods of treatment.

Preventive Treatment.—Plainly dressed animal food, well seasoned with common salt; good bread, with a sufficiently liberal allowance of wine or porter; plenty of exercise, and the occasional use of purgative medicine, constitute the best means of correcting that state of the system which appears to be favorable to the development of worms. *Tape-worm comes from infested pork, beef, and mutton; therefore let the meat be thoroughly cooked.*

Salt is absolutely necessary as a condiment to our food, and appears to be essential to the prevention of worms. According to a law which once existed in Holland, criminals were condemned to live on bread made without salt; the effect of which was, that worms were generated to such an extent that a lingering and terrible death is said to have been the consequence. Salt is not only an excellent preventive, but is one of the safest and best remedies that can be employed against worms. In the dose of from half an ounce to an ounce, taken every morning before breakfast, in warm barley-water or thin gruel, it has had the effect of expelling tape-worm after turpentine and other powerful remedies have been tried in vain. The same quantity dissolved in water, and used as an enema, is a popular and frequently a successful method of destroying the ascarides, or thread-worms.

WORMS IN MUSCLES (TRICHINA SPIRALIS), OR TRICHINOSIS.

In 1860 a disease was discovered in Germany which is now known as *trichinosis*, or the existence of worms in the human muscles. This is one of the diseases for the discovery of which we are indebted to the microscope. (*See Microscope.*) The existence of this parasite has been known since 1832. Small ovoid sacs were found in the human muscles that contained a small round worm coiled upon itself. It was at first supposed that these worms did no injury, and the discovery commanded but little attention.



TRICHINA SPIRALIS.

In 1860 a peculiar epidemic broke out in Dresden, Germany. The symptoms somewhat resembled those of typhoid fever and rheumatism. On examination of the muscles of one who died, it was found that they were filled with *trichinæ*. Portions of these muscles were given to a rabbit, and the rabbit died, and his muscles were found to be infested with *trichinæ*. Portions of the muscles of this rabbit were given to another rabbit. This second rabbit also became infested with trichinæ, and died.

Such was the discovery of the disease known as trichinosis. It is manifest that these *trichinæ* grow very rapidly. A single female can produce an enormous number of young. It should be remembered that lower orders of life breed rapidly. "One species of infusoria, visible only under a high magnifying power, is calculated to generate *one hundred and seventy billions in four days.*"

Concerning the symptoms caused by the presence of trichinæ, Prof. Dalton remarks as follows:

"Now to what symptoms does this accident give rise? As I have already said, within the first ten days there is irritation of the intestines. In some instances this irritation is very great; and the greater it is, the more favorable the prognosis, as a general rule. After eating trichinous flesh the patient generally begins to suffer within the first week, sometimes within two days. Now, if the irritation of the intestine be extreme, so that frequent and abundant evacuations are produced, the chances are very great that all, or nearly all, of the parasites will be discharged from the intestine. If so, the patient is safe. But if the irritation be not very marked, time is allowed for the young trichinæ to penetrate the intestinal walls, and enter the muscular tissue—from the end of the first to the end of the second week. This is the most dangerous period, the second stage of the disease. There is general pain and soreness, and œdematous swelling throughout the muscular system. At the same time typhoid symptoms manifest themselves; the patient is debilitated, his pulse rapid, skin hot, tongue and lips dry, and his general appearance closely resembles that of a patient with typhoid fever.

"The passage of the worms into the muscular tissue, and the changes taking place there, are very apt to produce symptoms which result in the patient's death at or before the end of the fourth week. By that time the worms have become completely encysted, and after this the symptoms of irritation begin to disappear. The muscular system becomes habituated, as it were, to the presence of the parasite, and after a while the symptoms all subside; the patient can move his limbs as before, and then considers himself as entirely recovered.

"The disease may be said to have two stages:

"First, the presence and procreation of the worms in the intestines. The symptoms of this stage are *diarrhœa*, *vomiting*, *and general debility*.

"Secondly, removal of the worms from the intestines to the muscles. The symptoms of this stage are severe pains and stiffness in the muscles, great debility, complete prostration, and a typhoid condition. The disease may terminate fatally in five or six days, or may last six weeks."

The great cause of trichinosis in man is eating pork that is either raw or not thoroughly cooked. The Committee of the Academy of Sciences in Chicago examined large number of hogs, and found *trichinæ in one out of fifty.* "Some of their muscles contained from 10,000 to 18,000 in a cubic inch."

The disease cannot be *cured.* It can be *prevented.* The way to prevent the disease is, *never to eat pork that is not thoroughly, completely cooked.* Thorough cooking (not merely warming) destroys the life of the *trichinæ.* If we act upon this rule we need not fear the disease.

Among other parasites found in the human body I may mention the *Guinea worm*, which is found beneath the skin. It is not uncommon in tropical regions. It is about one-twelfth of an inch in breadth, and in length varies between a few inches to *five or six feet.* They usually attack the lower limbs. They seem to get into the limbs of those who bathe or wash in ponds or streams. They are apt to produce ulceration at some point in the leg. Little weights are then attached to the worm, and it is slowly *worked out.* The process sometimes takes days and weeks.

A few years since I saw a terrible case of this in the State Hospital in New Haven.

WRITER'S CRAMP.

This name is given to a *spasmodic action of the muscles* when one attempts to make a particular movement, such as writing, sewing, playing on a musical instrument, &c. Though called "writer's cramp," it is not confined to writers. It may attack the milkmaid, the seamstress, and the artist, and may render it difficult or impossible for them to pursue their respective occupations. When it attacks the writer he finds that his pen slips from his fingers, that he cannot control it as usual, and that his handwriting becomes illegible.

The disease is a *nervous* one, and should be treated accordingly. It seemed to be caused by excessive use of certain muscles. The idea advanced by Professor Felton, of Harvard College, that the disease was caused by using steel pens is a delusion.

The disease is very obstinate. It seems to be a form of partial chorea, or St. Vitus's dance; and partial chorea, as stated under that disease (see *St. Vitus's Dance*), is usually an obstinate affection.

The best treatment that I can recommend for this disease is the assiduous and *persevering* use of electricity, in the form of general and localized electrization. (See *General and Localized Electrization.*) I have seen good results from the use of this remedy in one or two instances. Both galvanization and Faradaization may be needed. (See *Galvanization* and *Faradaization.*) The results from the use of electricity in this disease are by no means uniform. There are some cases that nothing will help. It is better to take treatment *early;* it is better still to *prevent* the disease, by taking good care of the general health, by exercising all the muscles of the body more or less every day, and by avoiding the too *exclusive* use of any one set of muscles in any employment for too long a period.

WRYNECK.

The appearance of this disease every one is familiar with. The head is drawn to one or the other shoulder by the contraction of the muscles of the neck. The disease is often accompanied by considerable pain of a dull, heavy character. This pain is sometimes relieved by lying down. The head at first seems to be drawn to one side by a succession of jerks. When the disease becomes fixed the head remains constantly on one side.

Wryneck must be distinguished from a common "stiff neck," resulting from a cold or rheumatic attack in the muscles of the neck, of a *temporary duration.* Wryneck is a chronic affection, and is apt to be very persistent. It sometimes resists all remedies. When it once yields to treatment it is very apt to return.

In the *early stages* wryneck will sometimes yield to the electric current (see *General Electrization* and *Localized Electrization*), or to friction (*rubbing*).

In the advanced and obstinate stages there are only two methods of treatment that promise any relief. These are localized electrization with the galvanic current (see *Galvanization*), and the hypodermic injections of morphine (see *Hypodermic Injections*). It is worse than useless to torture the poor patient with blisters, and annoy him with mechanical appliances.

The morphine may be injected into the arm in doses of from one-tenth of a grain up to as large a quantity as will be borne.

Neither the use of galvanization nor of hypodermic injections of morphine are well adapted or to be recommended for domestic use, except in special cases.

Those who are afflicted with obstinate wryneck, and yet cannot obtain skilled medical advice, had better attempt little or no treatment whatever.

YELLOW FEVER.

This species of fever very closely resembles the malignant or virulent typhus. The only difference is, that in the former the skin is not unfrequently tinged of a yellow hue, and there is a vomiting of dark-brown matter.

This vomiting of dark or black matter is characteristic of the disease, but the yellow tinge of countenance is not so; for although a symptom generally met with, it is not universal.

Symptoms.—An attack of the disease, known under the name of the yellow fever, is not unusually preceded by a defect of appetite, perverted taste in the mouth, heat in the stomach, flatulency, giddiness or pain in the head, dejection of spirits, languor, debility, and costiveness.

After a lapse of twenty-four or thirty-six hours, the patient is seized with lassitude and weariness; frequent rigors or chilliness, succeeded by flushings of the face; redness of the eyes, with pains in the eyeballs and forehead, extending in some cases backwards to the neck; great faintness, prostration of strength, and frequent sighing, with a tendency to stupor. There is excessive thirst; the tongue is coated with a tenacious fur of a dark-brown color; the spittle is viscid; the skin hot and dry; the pulse quick, small, and hard; the urine is high-colored, and scanty in quantity; but there is an unusual secretion of bile, which, getting into the stomach by a flowing back from the gall-bladder, is discharged by frequent vomiting.

In the further progress of the disease, the eyes and face in many instances become of a deep yellow color, which soon extends also to the chest; the stomach is highly irritable, and almost incessantly throws up a dark-brown or black matter; while at the same time the bowels are very costive, the urine is still high-colored, somewhat turbid, and small in quantity, and delirium of a peculiar nature arises.

It seldom happens that any perceptible remission occurs during this first stage of the fever, which usually lasts from thirty-six to forty-eight hours. At the end of this period there is generally some abatement of the symptoms; but a fresh paroxysm under a highly-aggravated form soon again takes place, and excites alarm both to the patient and his friends.

The fever proceeding in its course, with imperfect remissions and fresh paroxysms every twenty-four hours for several days, great debility becomes manifest, and symptoms indicating approaching putridity make their appearance. The tongue now becomes dry and black; the teeth and whole of the mouth are coated with a very dark-brown fur; the breath is highly offensive; the whole body is in many cases of a livid yellow color; dark and fetid stools are voided; discharges of blood take place from the nostrils, mouth, and ears; hiccups ensue; the pulse intermits and sinks, and at last respiration wholly ceases.

Causes.—Those which predispose a person to an attack of the yellow fever are intemperance, a full plethoric habit of body, intense hot and sultry weather, and exposure to night air or cold.

The exhalations arising from vegetable matter under a state of decomposition, or marsh effluvia, as they are termed by professional men, may, under a deranged state of the atmosphere from great preceding heat and drought, have given rise to this species of fever in the West Indies, particularly in persons habituated to a cold or temperate climate. It is also an unsettled point whether or not it is of a contagious nature. The opinion I hold, and ever did entertain is, that it is communicable from one person to another, or is contagious in an impure or deteriorated atmosphere, where many sick are lodged together in one room, and where there is at the same time a neglect of cleanliness and proper ventilation; but where there is a free admission of pure fresh air, and a proper attention is paid to strict cleanliness in every respect, its contagious properties may be so diluted as to become harmless, and incapable of being communicated to another person from the one laboring under it.

The yellow fever differs from typhus in the following circumstances, viz., it usually prevails only during or immediately after very hot seasons, in which the typhus is soon extinguished; and it is in its turn completely annihilated by cold weather, in which typhus is most prevalent, if accompanied by humidity in the atmosphere.

Our opinion as to the event of the yellow fever must be drawn from a careful consideration of the age and habit of the patient, the mode of attack, and the nature of the symptoms. The danger will be in proportion to the full and robust habit of the patient. Extreme debility, severe and incessant vomiting of dark or black matter, the sudden oppression of all the functions, tremors of the body when moved, dilatation of the pupils of the eyes, with great stupor, pensive sadness in the countenance, a weak irregular pulse, highly offensive breath, black and fetid discharges of urine and stool, and the appearance of purple or livid spots dispersed over the body—all denote that the life of the patient is likely to fall a sacrifice to the disease ere long. On the contrary, a considerable diminution of the affection of the head, a lively appearance of the eyes, free perspiration, a return of natural rest, the pulse becoming fuller and more regular, a gentle purging arising, or the urine becoming very turbid and depositing a copious sediment, and the stomach at the same time perfectly tranquillized, are to be considered in a very favorable light. The disease is apt, however, to exhibit deceitful appearances, and appears at times to be going off, when a sudden change takes place for the worse and carries off the patient; nay, some sink under it who apparently are in a state of convalescence.

TREATMENT OF YELLOW FEVER.

There is no specific for yellow fever.

In spite of all that we can do, the disease is very frequently fatal. Some epidemics are much more fatal than others.

The treatment of the mild cases is very simple. Give the patient perfect rest. Keep the sick-room freely ventilated. Sponge the body with cool water. Use mild laxatives—small doses of Epsom salts—to keep the bowels open.

Put the feet of the patient in a hot foot-bath, without raising him from the bed. This can be done by letting the patient slip down to the foot or edge of the bed, and allowing his feet to fall into a tub of hot water. Remember that *perfect rest* is necessary, and the patient must not be disturbed, even to take a foot-bath.

Keep the skin open by the spirit of mindererus (see *Mindererus, Spirit of*), or by a mixture of spirit of mindererus and sweet spirits of nitre, in equal parts, and in doses of a teaspoonful every two or three hours.

This treatment, cautiously carried out, is the best that we can do for the mild cases of yellow fever. It is very well known in the South, where yellow fever prevails, that the great thing in the treatment is good nursing.

I saw something of the disease in New Orleans and the Gulf of Mexico a few years since, and I am quite well convinced that the common impression on this subject is correct. In the present state of science the treatment for yellow fever is *good nursing.*

Besides the measures above indicated, severe cases of yellow fever will need special attention, according to the symptoms.

The irritability of the stomach may be relieved by swallowing, bits of ice, or by one-grain doses of the *oxalate of cerium.* (See *Oxalate of Cerium.*)

To prevent the black vomit, it is well to try the lead and opium pill (half a grain of acetate of lead and half a grain of opium).

If the patient becomes very much debilitated, alcoholic stimulants are often needed, just as in typhoid fever. Whiskey or brandy, or brandy-punch may be given, as the patient seems to need them.

The sick-room and the clothing of the patient should be thoroughly disinfected. (See *Disinfectants.*)

The good effects resulting from cold affusion in this fever are such that it ought to be employed at a very early period. Cold water, when applied externally, when the patient is distressed with the sensation of burning heat, generally affords very great relief to his feelings. It is only, however, when the temperature of the skin is raised considerably above the natural standard that cold water should be applied externally to the body by affusion, or even by wetting it with a sponge dipped in water and vinegar; and the period of its application and the frequency of its repetition must be regulated by the feelings of the patient; for should he become chilled by the application, much injury might ensue.

For the purpose of avoiding fatigue to the patient, which the preparation for cold affusion is likely to induce, it has been recommended that he should be covered in his bed with a single sheet wetted or wrung out in cold water, as this will reduce the heat of his body very considerably by the evaporation which takes place.

Where neither of these modes of applying cold water can be employed with convenience or safety to the patient, we ought to be content to substitute the wetting of the hands, face, and other parts of the body with a sponge dipped in vinegar and tepid water.

Some benefit may possibly be derived also from cold water, taken inwardly for drink, as the heat of the body, thirst, and severity of the fever have in many cases been moderated by frequent and small draughts of it.

If we are fortunate enough to obtain perfect remissions, we should immediately administer the Peruvian bark in substance, if the stomach will bear it; but if not, we must be content to substitute some lighter preparation of it, such as the infusion or decoction, persevering in the use of the medicine throughout the whole stage of convalescence, which is usually long and tedious. A few drops of the muriatic or diluted sulphuric acid will much increase the efficacy of the bark; and should any uneasiness of the stomach or bowels arise, or purging be excited, we may add six or eight drops of the tincture of opium to each dose of the bark and acid.

But should the fever resist our best endeavors to subdue it, and no perfect remissions be observed, but, on the contrary, run its course with violence and great exhaustion of strength, thereby threatening approaching, if not already apparent, symptoms of putrescency, the aid of the most powerful antiseptics must be called in. On some occasions a use of spirituous baths has been added.

Throughout the whole course of the disease the strictest attention must be paid to cleanliness in every respect. The linen of the bed, as also that of the body, should be changed frequently; whatever is voided by urine or stool should be immediately removed, and the chamber of the sick be kept perfectly cool, and properly ventilated by a free admission of fresh air into it. It may also be sprinkled now and then with a little warm vinegar. To assist in correcting any fetid smell, we may make use of the gaseous fumes arising from the muriatic or nitric acids.

At an early period of the yellow fever, the patient should be confined to diet of a mild nature, consisting of preparations of arrowroot, sago, barley, &c.; but as the disease advances, his strength must be properly supported by animal broths made of lean meat, such as beef-tea, veal or chicken broths, somewhat thickened by an addition of crumbled bread, oatmeal, or barley. Where great debility and exhaustion become evident, a moderate use of wine may be allowed; but it will be best to give it in a diluted state, as in the form of negus, which, as containing a vegetable acid, will add to its good effects.

"The food during the course of yellow fever should be of the blandest description, chicken tea, arrow-root, sago, and barley-water constituting the chief articles; and these should be taken in minute quantities at a time when the stomach is at all irritable. This rule applies to drinks of all kinds. The patient is greedy for a large draught of fluids; but by sucking them through a glass tube or a straw, or a hollow reed of small bore, or by the tea or table spoonful, they are much more likely to be retained. A cold infusion of oatmeal was found an agreeable drink for Scotch seamen, of which they did not seem to tire. A dislike of sweets was observed among the patients, and when lemonade was asked for, the usual quantity of sugar was objected to, probably from its rendering the liquid too dense for ready absorption by the stomach, and therefore less quenching. Tea was found so uniformly to disagree with the patients, and cause vomiting, particularly in the advanced stages, that at length it had to be expunged from the yellow-fever dietary. Dilute alcoholic drinks were given freely, and with good effect. Where brandy could be obtained pure (tolerably free from acidity and fusel oil), and was well diluted with water, that spirit answered every indication. Sometimes the effervescing wines were relished and retained, but they are very liable to the objections of containing foreign matters and the products of mismanaged fermentation.—*Blair; Aitken.*

ZINC.

The *sulphate of zinc*, or *white vitriol*, in the dose of twenty-five or thirty grains, acts quickly as an emetic, and is therefore the best medicine that can be used for this purpose in cases of poisoning from laudanum and other narcotic substances. It is employed as a tonic and astringent in the dose of two grains twice or thrice a day in chronic dysentery, whites, and other discharges from the mucous membranes, and in the humid asthma of old people.

ZINC, VALERIANATE OF.

This remedy is somewhat used in nervous diseases. It is sometimes successful in neuralgia. The dose is one grain in pill.

PREGNANCY, LYING-IN ROOM,

AND

MANAGEMENT OF INFANTS.

SIGNS AND SYMPTOMS OF PREGNANCY.

General Symptoms.—When pregnancy has taken place, the face usually becomes pale, the under part of the lower eyelid is of a leaden hue, the features become sharper, and not unfrequently the person becomes thinner, the temper is often more than usually irritable, sickness in the morning and after meals, feverishness, indigestion, heartburn, languor during the day, disturbed sleep and disagreeable dreams at night, are often the accompaniments of pregnancy. A sense of bearing down, an irritation about the bladder and the seat, an unaccustomed flow of urine, are also not uncommon symptoms in the early stage of pregnancy.

State of the Navel.—This, many have considered, presents one of the most decisive evidences of pregnancy. When it has taken place, the navel is drawn inwards and downwards during the two first months; in the third it is natural; in the fourth it is not so hollow as before conception; in the fifth and sixth it is almost level with the surrounding surface; in the latter part of the sixth and the seventh month it is quite so; while towards the latter month of gestation it projects considerably. If these symptoms follow in regular succession, it may be considered a decisive sign of pregnancy.

Ceasing to be Unwell is one of the most common, and generally an early symptom of pregnancy; but it is by no means a certain sign, as it may arise from many other causes; if you have been regular up to the time of marriage, it is good presumptive evidence. Such, however, are the caprices of nature, that in some persons this evidence is never decidedly manifested: in such cases it will usually be found that the discharge is smaller in quantity, returns at irregular intervals, and does not last the usual time.

Enlargement of the Breasts.—This is an appearance which, if unaccompanied by other signs, is of little value; but if it has been preceded by somewhat of a diminution of their size, and this enlargement then takes place about the third month after the preceding sign, and is accompanied by a slightly painful and prickling sensation, with a sort of knotty external feeling when the hand is applied to the surface, and particularly if there is occasionally a milky discharge from the nipple, it may be considered presumptive evidence of pregnancy. It frequently occurs that the breasts become enlarged shortly after marriage, from the person becoming stouter; but in this case the whole person experiences the same change, and the breasts are soft and have not that knotty feeling to the touch.

Swelling of the Nipple, and the appearance of the areola or circle surrounding the nipple, are by many writers considered as among the most decisive of those signs of pregnancy which are exhibited previous to quickening. In fair women, and particularly with their first child, the change in the areola is very manifest: from its beautiful roseate hue it turns to a dusky-brown shade; it increases in size, and continues to darken until the term of gestation is completed. As pregnancy advances, a number of slight excrescences, resembling small pimples, will also frequently appear thereon; and when the individual has had children, or is of a dark complexion, this appearance is one of the best criterions for determining the true areola of pregnancy.

Morning Sickness.—This distressing affection of pregnancy occurs during the earlier months. It may commence almost immediately after conception; but the most usual time of its appearance is two or three weeks after. It arises wholly from sympathy with the newly established action of the womb. This is neither a necessary nor an infallible sign of pregnancy, as sickness may arise from other causes, and by some individuals it is never experienced. It may be observed, however, that it has this peculiarity, viz., that it does not affect the general health, nor does it usually impair the appetite.

Enlargement of the Abdomen.—At an early period of gestation the abdomen usually becomes flatter, and it is not until about the third month that the enlargement is perceptible.

Quickening simply means the first sensation which proves to the mother the vitality of her child. The feeling is so peculiar and so sudden, that it often occasions fainting and hysteria. The sensation, which has been compared to the fluttering of a bird, is occasioned by the womb suddenly rising from the pelvis, where the motion of the child could not be felt, to a part that is more sensible. It is not uncommon for a few drops of blood to escape from the *womb* at the moment of the first sensation. Quickening usually takes place about the fourth month or eighteenth week; but in some cases it occurs as early as the third month, and as late as the fifth. At first the movements of the child are feeble; but in a short time they become strong, and its motions are felt not only internally, but very distinctly, on applying the hand to the abdomen. Instances are of frequent occurrence when the motions of the child are so lively as to occasion much distress to the parent; but a sensation resembling this cannot be depended on as a proof of pregnancy, if it be unsupported by other evidence.

CONDITIONS SIMULATING PREGNANCY.

Cessation of the Menses.—So many diseases may produce this effect, that there is not space here to go into particulars; suffice it to warn those especially who are married late in life, that this disappearance, though continued for months, is no proof of pregnancy, although, as before said, if the individual be *young*, and has been regular up to the time of marriage, it may be considered presumptive evidence.

Enlargement of the Breasts may arise from increased obesity, or from the stoppage of the menses.

Sickness, Heartburn, Languor, Distension of the Abdomen, may each arise from indigestion.

Quickening.—Persons who marry late in life are most liable to be deceived by an appearance of quickening when pregnancy has not taken place; and even medical men have been deceived by this appearance, when they have relied on it unsupported by other evidence. This deception is occasioned by the collection of wind in the bowels, which, even to the touch, resembles the movements of a child.

Enlargement of the Abdomen may arise from dropsy, disease of the ovary, excessive obesity, and many other causes, which bring us to the conclusion with which we set out, viz., that although each of the signs of pregnancy enumerated may be valuable as accessories, yet, isolated, neither is an infallible one of pregnancy.

DURATION OF PREGNANCY, MODE OF RECKONING.

The duration of pregnancy is usually two hundred and eighty days, but it may continue as long as three hundred days, and in very rare cases even longer. In other cases the duration of pregnancy may be only two hundred and sixty days, or even less. It is impossible to calculate the period of labor exactly, but the nearest approach will be obtained by noting the last day on which signs of menstruation were visible, and counting two hundred and eighty days, beginning with the *day after* that on which the flow ceased.

DIET, EXERCISE, &c.

Diet.—It is of the highest importance that women about to become mothers should be generously nourished. An abundance of animal food should be taken, and such articles of diet as have been found to disagree should be carefully avoided. The capricious appetite common in the latter part of pregnancy may be indulged within reasonable limits. All stimulants had better be avoided, or taken only by the advice of a physician.

Dress.—The dress of a pregnant woman should be always loose; tight lacing must on no account be allowed; it prevents the development of the breasts and abdomen; impedes the growth of the infant; causes inflamed breasts, sore nipples, and all the disastrous consequences which result therefrom; occasioning acute suffering to the mother, and frequently depriving her of the comfort of suckling her child. In the advanced stage of pregnancy it will frequently produce palpitation of the heart, swelling of the legs and veins, costiveness, and scalding urinary evacuations.

Exercise.—Popular errors upon this subject of a directly opposite character exist, both of which must be avoided. Let mothers pay particular attention to the following remarks: After conception has taken place, the individual should for days take but little exercise; her mind should be kept perfectly quiet, and all exciting causes avoided. Moderate exercise is, however, proper at every period of gestation, unless symptoms of miscarriage present themselves. Walking is the best exercise, but it should not be continued until fatigue is produced. Sailing is a very beneficial mode of exercise, if the season be favorable. Long journeys—long walks—running or dancing should be particularly avoided. Violent exercise is the ordinary cause of floodings from the womb; abortion, rupture, or premature labor may follow; and be it recollected that miscarriage is far more injurious than parturition at the proper period. Lamentable instances of its effects are continually brought under the observation of every medical practitioner. Few, indeed, whose practice has been extensive but have seen the young and lovely thus hurrying onwards to a premature grave, from the momentary indulgence of a whim—a vanity—in spite of advice and in defiance of warnings.

As the period of parturition approaches, more rest is required than in the earlier months; still, however, recollect that air and exercise, if they can be taken without fatigue, will be highly beneficial. But when there is a tendency to miscarriage exercise must wholly be avoided.

LATE HOURS are highly injurious to the pregnant woman; she should retire to bed early, and take from seven to nine hours' repose; common sense and ordinary experience must force this on her attention; the lethargy and fatigue which affect her towards night; the desire to be disburthened of her clothes—the refreshment which she experiences by their being loosened from their ordinary fastenings, all point out to her the requirements of nature.

The state of the bowels should be constantly attended to, and the usual constipation avoided as far as possible by diet, injections, and the mildest measures, all violent cathartics being scrupulously avoided.

DISEASES OF PREGNANCY.

VOMITING generally commences shortly after conception, and ceases on quickening. It is usually most troublesome on rising, and hence has obtained the name of *Morning Sickness*, though its attacks are not unfrequent after meals. Sometimes it is very violent and continues all day, and everything taken into the stomach is rejected. This form of the disease requires great attention, and the presence of a medical man. The former will generally be relieved by a mixture composed of a scruple of bicarbonate of potash or soda, dissolved in a wine-glassful of water and taken during effervescence with a tablespoonful of lemon-juice. These draughts may be repeated thrice a day if the sickness be troublesome; or half a teaspoonful of citrate of potash in water every hour until the sickness is removed. Very distressing cases of nausea may sometimes be obviated by taking a small cup of tea or coffee and a piece of toast or bread before rising in the morning.

HEARTBURN AND ACRID ERUCTATIONS denote acid in the stomach, and are relieved by opening the bowels with magnesia, and taking half a teaspoonful of carbonate of soda, or a wine-glassful of lime-water in milk, three times a day, or when required.

SPASMS OR CRAMP OF STOMACH AND BOWELS.—If *slight*, hot fomentations should be applied as warm as they can be borne, and ten drops of laudanum taken every fourth hour. If *very severe* advice must be obtained.

INCONTINENCE OF URINE is sometimes troublesome during pregnancy, but rest is the only remedy.

FAINTING is most usual during the first three or four months. It generally comes on after exertion, agitation, purging, or exposure to heat. The patient should be laid down with the head low, air should be freely admitted, the dress loosened, the face sprinkled with water, and the forehead and temples rubbed with cologne or any refreshing lotion. The same treatment will apply to hysterical convulsions.

COUGH.—It is generally dry and difficult of cure, and may depend on so many causes, that advice from the medical attendant had better be sought.

SPITTING OR VOMITING OF BLOOD calls for immediate professional assistance.

HEADACHE.—If severe and constant, and there is fulness of blood indicated by a flushed face, dull or bloodshot eyes, sense of giddiness, heaviness over the eyes or in the skull, and the person is far advanced in pregnancy, advice should be taken *without loss of time*. All headaches are, however, not dangerous. They may arise from costiveness, indigestion, or nervousness.

TOOTHACHE often attacks sound teeth. In such cases extraction is improper.

IRRITATION OF THE BLADDER, RETENTION OF THE URINE, OR DIFFICULTY OF PASSING IT, require the bowels to be kept open. Drinks of linseed tea, barley-water, slippery-elm tea, &c., should be taken freely; and the patient should recline on a sofa. Great care should likewise be taken not to retain the urine long.

SALIVATION is sometimes very troublesome. Washing the mouth with alum-water, and keeping the bowels gently open, frequently afford relief; if they do not, have advice.

PAIN AND ENLARGEMENT OF THE BREASTS may be treated by warm fomentations frequently changed.

SWELLING OF THE FEET AND LEGS.—The bowels should be kept open, and a bandage applied every morning. The swelling usually goes down in the night, and during the day the recumbent position should be maintained as much as possible.

ENLARGEMENT OF THE VEINS OF THE LEG requires the careful pplication of a bandage, and rest in a recumbent posture. This ould be attended to by a medical man, as severe consequences en follow neglect.

CRAMPS OF THE LEGS AND THIGHS are often relieved by mere change of position. Gentle friction, with soap liniment six drachms and laudanum two drachms, is frequently very useful.

DESPONDENCY, MELANCHOLY, ANTIPATHIES, &c.—These are not uncommon. The two first are best remedied by change of scene, air, gentle exercise, cheerful company, and due attention to the diet, which should not only be nourishing, but varied and palatable.

CARE OF THE NIPPLES.—For a month or six weeks before confinement, especially in a first pregnancy, attention should be paid to the state of the nipple. If it appear healthy, not tender to the touch, and the skin of moderate thickness, nothing more is required than that it should be rubbed two or three times a day with a little sweet oil, and all pressure from corsets and the clothes most carefully avoided; for this pressure is frequently the cause of soreness and flatness of the nipple. If the nipples are painful, and the skin is thin, they should be washed three or four times a day with any astringent infusion, as of green-tea, oak-bark, willow-bark, or brandy or spirits, and exposed to the air each time for ten or fifteen minutes, or longer.

SYMPTOMS OF LABOR.

Generally for some days (it may be two, four, six, eight, ten, or twenty days, or only a few hours) previous to the accession of those phenomena which characterize the existence of labor, there are often present certain premonitory signs of its approach, and which, by women who have borne children, are viewed as precursors of that eventful hour.

RESTLESSNESS, particularly at night, is frequent for days and weeks, and is not to be considered unfavorable.

SUBSIDENCE OF THE WOMB AND ABDOMEN is a usual monitor, and may be viewed in a favorable light, as it indicates room in the pelvis or basin of the body. The female feels as if she carried the child lower than formerly, and thinks herself slacker and less than she was before; and in many cases, though before inactive and indolent, she now feels lighter and more alert.

GLAIRY MUCOUS SECRETION, SOMETIMES STREAKED WITH BLOOD, occasionally occurs days before the active symptoms of labor, and renders the parts moister than usual; which are also enlarged, relaxed and soft, and sometimes painful. The discharge spoken of is commonly known by the term, *a show.*

IRRITABILITY OF THE BLADDER, AND IRRITATION AND GRIPING OF THE BOWELS are often present as symptoms of approaching labor, and demand their frequent relief. Pains in the back and loins, commonly known as bearing-down pains, may occur at this time. They are *false pains*, but so greatly do they resemble the pains of labor that the medical man only, upon an examination, can distinguish between the two kinds.

THE MOVEMENTS OF THE CHILD become stronger and more active, and are felt lower down; and there are also pain and weight in the loins. When the above symptoms occur it will be well to send for the nurse, and apprise the female friend who is to be present at the approaching event.

THE LYING-IN CHAMBER.

THE BED should be so placed that the room may be well ventilated, without its being in a draught. The bed-curtains, if any, should be thin, and never completely drawn round the bed, so that pure air may be freely admitted and the impure air easily escape. The bed should not be *against the wall*, but placed so that assistance could be afforded on either side if required. The patient is liable, if placed on a *feather bed*, to sink into a hole, and thus prevent her medical attendant from being of so much service to her as he might be. It will, therefore, be advisable to place the mattress on the feather bed, and over it should be put one or more dressed sheep-skins, or a piece of oil-cloth or oiled silk, and above this the ordinary binding blanket and a clean sheet in the common manner; another in the form of a roller should be applied across the bed, having the ends folded in at the sides; a coarse blanket, folded within a sheet in the form of a table napkin, should be laid immediately underneath the patient, so as to be easily removed after delivery; the upper sheet, blanket, &c., are put on as usual.

THE DRESS should be as slight as possible. A loose dressing-gown does very well in the earlier stage of labor, but in the more advanced a bed-gown and chemise should be worn; the latter is to be folded round the waist, so that it may be kept dry and be drawn down after labor is over. The lower part of the body should be covered with a petticoat, so made that it can be taken off without raising the person when delivery has taken place.

The stays should never be worn, but in their place a broad double calico bandage, or binder, made with three rows of tapes on each side, so that it can be made tighter as labor progresses, and be used for the ordinary binder afterwards. If it is made with straps to come under the thigh from the back, to fasten in the front with a button, it will be kept down better.

HEAT OF THE ROOM.—This should be regulated by the patient's feelings. If too hot, it will produce fever, add to the fatigue, often render the pains irregular and ineffective, and thus protract the labor

ATTENDANTS.—The only attendants required are the nurse and medical man, but a female friend may be allowed, for it inspires confidence. Avoid whispering, or any appearance of concealment, as it may make her distrustful of her own powers, and perhaps doubtful of those of her necessary attendants.

SLEEP.—If she be disposed to sleep between her pains, she should not be disturbed.

FOOD.—There is seldom much inclination for food, and, if the labor is not protracted, no occasion for it; but if there is an inclination to eat, she may have a little tea with dry toast, soup, sago, or light pudding; but everything heavy must be avoided.

THE URINE should be regularly and frequently evacuated. The *bowels*, if not open, should be acted upon by taking, as labor approaches, a tablespoonful of castor oil, or an injection composed of a pint of thin gruel and an ounce of castor oil. Much comfort is derived from this, and the unpleasant consequences which sometimes take place near the end of labor (if this has not been attended to), avoided. On the other hand, if the bowels are too much relaxed, take ten drops of laudanum in a wine-glass of water.

SHIVERING is very common, from a gentle tremor to a complete and violent agitation of the body. When this is the case, some warm tea or gruel, without wine or spirits, should be taken.

VOMITING is not uncommon, and is useful by emptying, perhaps, an overloaded stomach; it also tends to facilitate the labor.

CRAMP during labor is frequent, and may arise from having been in one position too long, for change of posture relieves it; but if in the hip and thigh, it generally proceeds from the head of the child pressing on a particular nerve in the pelvis, and is not removed until it has passed that part.

DURATION OF LABOR.—A first labor is generally the most protracted; but under proper management, and due submission on the part of the patient, is not more dangerous than subsequent ones.

NAPKINS, &c.—The nurse will of course attend to there being a sufficient supply of well-aired napkins, a pair of scissors, a skein of thread, and a proper receiver of flannel for the infant.

HOT WATER.—It will also be well to have an abundant supply of hot water in the house, which would be required if the infant should happen to be born in a state of asphyxia, or suspended animation.

ICE.—It is well to provide some ice also, in case it should be necessary to arrest hemorrhage, or for other purposes.

LABOR.

Symptoms of Labor.—There is pain in the back and loins, occurring at *irregular intervals*, and producing most disagreeable sensations; there is also generally a show; these sensations continue; the patient becomes uneasy; has frequent warm and cold fits, with urgent desire to pass urine, &c., and is exceedingly restless; every situation and position appears insupportable and uncomfortable to her. By degrees the pains increase in frequency and force; they occur now at *regular* intervals of ten or twelve minutes, and do not occasion that continued uneasiness as at first, for when the pain is passed she is pretty easy.

Close of Labor.—When the labor is proceeding rapidly and the pains become bearing down, the bed must be kept altogether. This is what medical men call the second stage, and having arrived, the patient may assist by exerting her abdominal muscles and diaphragm. To enable her to do this she must not scream, but during pain hold her breath. A towel will also be fixed to the bedpost for her to pull by, or the hand of another person. But this auxiliary ought not to be employed to pull up by so much as to *fix* the trunk. And if the patient only follow the dictates of nature in this matter, she will do right; for she will find that all that is required is almost an involuntary exertion of voluntary muscles. Let her, however, be careful to make no straining effort in the absence of pain, during the intervals of which she ought to lie at perfect rest, renewing her strength. As its termination immediately approaches, the patient must be careful not to give way to feelings of impatience and become restless, but implicitly follow the directions of her medical attendant, otherwise serious consequences to herself might afterwards ensue. And now, if she have previously obeyed his instructions, she will be in possession of that strength and fortitude which are called for at this time, and prove invaluable.

How to proceed if the Child be born before the Arrival of the Medical Attendant.—It not unfrequently happens, subsequent to a first confinement, that with some females their labors are so rapid and short (two or three strong and powerful pains being sufficient to bring the child into the world) that it is quite impossible for any medical man to get to them in time for their delivery.

Under these circumstances the friends are generally excited and alarmed. There is no occasion for this. All that is necessary to do is to see that the child is so placed that it shall obtain plenty of air.

Some nurses will tie the cord and separate the child. There is no objection to this, provided the child is alive, and respiration *fully* established. *But no nurse ought to be permitted to remove the after birth.* This hint cannot be too strongly borne in mind; for an injudicious interference with the after-birth might be attended with the most serious consequences.

After-pains.—About half an hour or so after delivery, a patient must expect pain again to occur. These pains, however, will differ from those which have just subsided; as they are not attended with bearing-down efforts, and are accompanied by a slight discharge, these are called "after-pains." They will continue off and on with more or less frequency, severity, and duration, for about eight-and-forty hours. In this respect, however, they vary much in different individuals; but, whether mild or severe, they must be borne with patience, and must not give rise to anxiety, since they are useful and salutary.

Puerperal Convulsions physicians treat by the cautious administration of ether, cold to the head, bromide of potassium, &c.

AFTER DELIVERY.

Faintness and Langour frequently occur immediately after the child is born, even in short and easy labors. The medical attendant will in this case order his patient wine, ale, or spirits, in the proportion that may be required.

The Bandage.—If this is not already passed round the body the medical man will do this, and make it as tight as he may think needful.

The Dress, Bed-Clothes, &c.—The petticoat worn during the labor may be removed soon after delivery, and the chemise, previously rolled around the waist, brought down. The wet clothes may also be cautiously removed (without it has been ordered otherwise); but in doing this great care must be taken not to move the patient roughly, or permit her to make any effort. She *must be perfectly passive*, and her attendants will on *no account* raise her from the recumbent position *in the least;* but one person taking the feet and another the head, gently remove her as much as may be required to enable them to get away those things that are soiled. *Fatal flooding has been produced by raising the body to a sitting position.*

The Diet.—The old custom of starving after confinement has cost many a woman her life. The other extreme must of course be avoided, but the patient may generally be allowed a sufficient quantity to satisfy the appetite of light nourishing food, including some meat. Soups and slops are more likely to disagree, and furnish less nutriment. But specific directions as to the most appropriate diet in individual cases can be given only by the medical attendant. Ale and spirits should never be given without advice, but in the absence of explicit instructions it is a good rule never to let the woman complain of hunger. As soon as appetite shows itself, let it be gratified with good nourishing food.

Acid drinks may be given freely, if there is much thirst.

THE MIND after delivery is often in a state of excitement, and highly susceptible of impressions. It is therefore obvious that anything which could excite emotion *in health* should be guarded against during confinement. For this reason the bedroom should be at the back of the house, or means should be taken to lessen the noise of the street. Above all things keep friends and acquaintances out of the room, and guard the woman carefully against the fatigues of conversation. Let the room be dark and quiet, and by all means encourage sleep, and never allow it to be broken needlessly. After a difficult and exhaustive labor, *absolute repose*, mental and physical, is indispensable to a good recovery, and the want of it may endanger the woman's life. All the resources of the pharmacopœia cannot furnish the equivalent of an hour's sound sleep.

VENTILATION.—It is necessary that the room be kept well ventilated, and pure air often admitted. For this purpose the windows should be opened from time to time, and the curtains round the bed should not be closed. Everything that can give rise to an unpleasant smell should be directly removed.

THE LOCHIA, OR DISCHARGE.—This varies much as to quality, appearance, and duration in different women, and in the same woman in different confinements. It is sometimes scanty, and sometimes so profuse, especially in those who do not nurse, as to require medical treatment; but, without it runs into one extreme or the other, it need create no alarm. For two or three days it has the appearance of pure blood; it gradually changes to nearly white; then to a greenish or brownish cast; and at last entirely ceases. It does not always follow this course, but the red color may disappear and reappear two or three times.

Sudden obstructions of the discharge may be occasioned by exposure to cold, or indicate some disease, and are always alarming; if attended by pain in the abdomen, fever, sickness, &c., the medical attendant must be sent for; but in the meantime let the lower part of the belly be well fomented, and let drink of some warm diluent, as whey, barley-water, or thin gruel, be given. Extreme cleanliness during the continuance of the discharge is imperative.

GETTING UP.—Under no circumstances should the woman be allowed to sit up before the seventh day, and then only if it is evident that she can do so without dangerous fatigue. For several days after first getting up the movements should be very slow and gentle, and the reclining posture must be resumed whenever fatigue is experienced. For every day that women are up too soon they often suffer years of misery in after life. Some of the most obstinate uterine diseases to which women are subject owe their origin to exertion too soon after confinement, while the uterus is yet large and heavy, and its surroundings weak and relaxed. If the bedroom is cheerful and well ventilated, it is better for the mother to remain in it from two to three weeks, and not to venture out-of-doors before the fourth week.

OF SUCKLING.—The child should be put to the breast at once—the sooner the better.

If there is *no* milk, the action of sucking promotes its secretion. The nipple should be washed with warm water, before applying the babe, to remove a bitter substance which the glands round the nipple furnish.

If, as often happens after the first confinement, the nipples are so flat that the infant cannot take hold of them, they should be well fomented and drawn out by a child a few weeks old, or by a proper breast-pump; but this must be used with great gentleness and care. When this has been practised two or three times, the child will generally be able to suck. The patient should not be fatigued by the long-continued or frequent application of the child, and she should place it in a position most *easy to herself*.

SORE NIPPLES.—If they are tender and fretted, the strong infusion of green tea, brandy, or the lotion of zinc—using each daily in its turn—will quickly harden the skin, and remove its irritability. If not, try a lotion containing one grain of the nitrate of silver dissolved in one ounce of distilled rose-water; or, what is perhaps better than all, wash the nipple often with the tincture of catechu. These applications should be used freely and frequently during the day, and the part exposed to the air afterward.

If they are not only tender and fretted, but also hot, dry, and very painful to the touch, and yet not chapped, the stimulating applications before advised would only aggravate the mischief. A bread and water poultice should be first applied, changed every three hours, and fomentations of warm water, or decoction of poppy-heads, after each poultice is removed.

When the unnatural heat and great pain of the part are relieved, it must be dressed with a little spermaceti ointment spread upon thin linen or lint.

From the friction, however, of the child's tongue and gums, the skin may have become excoriated, and cracks formed upon the nipple, or around its base. Every time the infant sucks they bleed, and the mother suffers exquisite pain.

The first object in the treatment is this: that the infant shall obtain its nourishment from the breast without its mouth coming in contact with the nipple. This is accomplished by means of shields made of glass, wood, ivory, or silver. The shield is neatly covered with an artificial, or prepared cow's teat, through which the child sucks without biting or irritating the nipple.

THE DIET, through the whole period of suckling, should be simple, nutritive, and such as is easy of digestion. If the food taken agrees well with the mother, it seldom if ever disagrees with the infant.

No food agrees with an infant so well as the natural; and for six months nothing else, except it be absolutely necessary, should be given. About that time it should be prepared for weaning, by having a little thin gruel or sago given to it two or three times a day. Weaning should take place when it is about ten months old. After that time the milk becomes vitiated in quality.

It is an error to suppose that the constitution suffers from suckling. Very many women have improved in their health by performing this most feminine of all offices. Many very delicate females have experienced the best effects from nursing their children; and many of the complaints incident to women are removed or alleviated by it. Excepting the period of gestation, fewer women die when nursing than at any other period. The spirits during this time are generally more lively and uniform, the temper milder and more even, and the general feelings more healthy and pleasant than before.

If a mother's own feelings for her infant alone will not lead her to nurse it, there is yet another reason to urge that she should do so. It is, that if not suckling, it is most probable that pregnancy will again speedily ensue, and instead of there being an interval of two or three years, she will be confined every year. Few constitutions can bear up long against this; the health soon becomes shattered, and a premature old age supervenes.

Fretfulness, agitation, and all violent emotions should be eschewed; they vitiate the milk. A fit of violent passion in the mother has produced convulsions in the infant, and even death.

NURSING SORE MOUTH.—Many mothers, while nursing their children, are afflicted with extreme soreness of the mouth. In some cases the suffering is acute and without intermission; the patient can take no food but liquids without torture; she shrinks from the pain even of articulation, becomes disheartened, loses all elasticity of spirits and all fortitude, her strength fails and her flesh wastes away. Said one who had experienced it, "It is the most *wearing* suffering which I ever endured."

This affliction is *peculiar* to nursing mothers. They must endure it, wean their babes, or resort to skilful medical treatment.

It sometimes unfortunately happens that, from ill health or other causes, a lady cannot suckle her own infant, which is always to be regretted, for no milk will agree with its constitution so well as that of the mother. It is then necessary to select a proper person to take upon herself the maternal office. When it can be done, before engaging her she should be sent to the medical man for approval. But sometimes this is not convenient, and it is therefore necessary to describe who is and who is not a proper person; for, from one not fit for the office, the infant will receive more hurt than benefit, and had better be brought up on artificial food.

The wet-nurse should have an adequate supply of milk; which should be thin, and of a bluish-white color, of a sweetish and faint taste; and should, on standing, be covered with a considerable quantity of cream. Her confinement should have taken place about the same time as the lady's who requires her services, so that her milk corresponds with the age of the child it is designed she should nourish.

A woman above thirty-five years of age should not be chosen; nor one of a petulant disposition; nor one with small breasts, or excoriated nipples, or who *is unwell* while suckling; who has any hereditary disease; who has nursed several months, as the milk may soon leave her, or become of bad quality; nor one of bad moral conduct, for one who drinks or who is otherwise dissipated will do the child harm.

If the nurse's child is alive, it should be examined to see how it has thriven, and both it and the nipple of the woman should be inspected for fear of a taint.

MANAGEMENT OF THE NEW-BORN INFANT.

The infant, warmly wrapped up in a flannel receiver by the medical man, and given to the nurse, if it be cold weather, is to be dressed by a good fire. This is necessary, both because the temperature of the child's body at birth is several degrees below that of the adult, and because its power of retaining its warmth is also less.

The first thing to be done is to *wash* the child; and as its body will be found covered with a white, greasy, curd-like substance, this must be removed, and with great care, particularly from the eyelids, groins, armpits, and from the folds in the skin. This is most easily accomplished with warm water, fine soap, and a soft sponge, the child having been previously well oiled. If any of this secretion is not removed, it dries, hardens, irritates the delicate skin of the infant, and sometimes even produces severe excoriations.

The surface of the child's body having been thoroughly dried with a soft towel, the next thing is *to put up the remains of the navel string*. Having been examined by the medical man previous to his leaving the chamber, it is presumed that its vessels are properly secured, and it is now to be protected from injury until it separates from the body of the child—an occurrence which usually takes place somewhere between the fifth and fifteenth day from delivery. The mode is as follows: A piece of soft old linen rag doubled, and about four or five inches in diameter, is to be prepared, and a circular hole cut in its centre, through which the cord is to be drawn. The cord being carefully folded up in this envelope, is to be laid on the abdomen of the child, and secured by what is called the belly-band, viz. a band of thin flannel five or six inches broad, and long enough to go twice round the body. This ought to be fastened with strings, pins in any part of an infant's dress being objectionable.

The child is now to be dressed; and about this it is unnecessary to say more than that it should be sufficiently warm, and not calculated to place the slightest restrictions upon the movements of the limbs; and in reference to the head-dress, that a thin muslin cap in summer, and a thick one in winter, is all that is required; and more than this, or anything that shall compress or restrain the free motion of the child's head, is highly injurious.

At birth, or two or three days subsequently, the breast of the infant will frequently be found swollen, hard, and painful, containing a fluid much resembling milk. Nurses generally endeavor to squeeze this out, and thus do great mischief; for by this means inflammation is excited in the part, and sometimes abscess is the result.

If the breasts are simply slightly enlarged, it is unnecessary to do anything more than rub them occasionally and very gently with warm almond oil, and a little time will restore them to their proper size.

The face and eyelids, and many other parts, may be much discolored when the labor has been very difficult; but these appearances generally go off in a few days, when no violence has been used in the delivery.

RETENTION OF URINE.—Occasionally an infant will not pass any urine for many hours after its birth. This most frequently arises from the fact of none being secreted. In the last case of this kind that I was called to, three days had elapsed since birth, and no urine had been passed; it proved that none had been secreted. Sometimes, however, it is the effect of another cause, which the use of the warm bath will be found to remove, which should always therefore be employed four-and-twenty hours after the birth of the infant, if it has not by that time passed any water.

FOOD.—The new-born infant will not require any food, if put to the breast soon after its birth.

If it is necessary to give the infant anything, a little sweetened barley-water, milk and water, or very thin and well-strained gruel, are the best substitutes for the breast; these must, however, be given slowly, and but a few teaspoonfuls at a time; for an infant a few hours old would be a long time in sucking a teaspoonful; and the person who may have it in charge must bear in mind that its stomach will *not contain* more than two or three tablespoonfuls.

The stomach and bowels of a new-born infant are filled with a blackish-colored matter, commonly called the *meconium*. This is generally passed soon after birth by the mere effort of nature. The custom of giving a purge is unnecessary; the first part of the mother's milk is laxative, and answers the purpose better than any medicine.

ON THE GENERAL MANAGEMENT OF INFANTS.

By the word "Infancy" is to be understood that period of the time included in the space from birth to the completion of the process of teething; when all the teeth have appeared, *childhood* commences.

The temperature of the nursery should be much the same as is agreeable to a healthy adult, during the whole of the first month; afterwards it should not be above 60 degrees. Sudden changes of temperature should be avoided. The room should be well ventilated, for the infant and mother both require pure air; but a current of air should not be allowed to pass over either of them.

FOOD.—The experience of ages is in favor of an infant's being nourished entirely on the breast milk for at least six months. After that time it is well to feed it once or twice a day with thin sago or arrow-root, to prepare for weaning.

CLOTHING.—The clothing of infants should be, as already stated, warm and light. The long clothes may be worn for about six months; after that time shortened one quarter, and progressively to the length which will enable the infant to walk. Warmth is most essential to an infant's well-doing and comfort; and this is best effected by using fine flannel next the skin.

WASHING AND DRESSING, as before recommended, should be performed with great tenderness and care; for if done violently and hastily the child will scream and cry, and when this happens it is generally owing to the awkwardness of the nurse. The *whole* body of the infant should be washed night and morning; and those parts of the body liable to be soiled, after each evacuation. The parts most likely to become excoriated are the folds of the skin about the armpits, neck, and groins; and these, after each washing, should be well dusted with hair-powder or starch finely powdered, or some other absorbent powder.

CLEANLINESS.—The most scrupulous regard must be paid to this, not only for the comfort of the babe, but also from fear of cold, &c. The moment a napkin is soiled or wet, it should be, even in the night, instantly removed, and replaced by a dry and warm one; the parts, if soiled, being first carefully washed with a sponge and warm water, and the groins freely dusted.

EXERCISE.—For the first month the infant requires but little; the fatigue it undergoes from being washed and dressed twice a day, and the requisite *changing*, is enough, together with being gently carried a few times across the room five or six times a day; but after the month, on every fair day, it may be carried out for an hour about noon with advantage. The person carrying it should hold it in the horizontal position, and walk slowly and gently, avoiding all running, jumping, or twisting round; but she should never stand still, and especially avoid doing so at the corner of a street, because of the increased draught of air in that situation; for the same reason, standing in the lobby of a house with the door open is particularly injurious. As the infant advances in age and strength, the time of its being out should be prolonged gradually, until it almost lives the whole day in the open air; it should be carried horizontally, until it shows a disposition to *sit up*, and even then its head and back should be carefully supported. Until the infant is some months old, it should not be *tossed up;* for these tossings, from the fragile state of the bones, might occasion fracture. Gentle exercise in the arms, *often changing the position*, and nursing *on both arms*, is the best until it commences walking, though there is no objection to permitting the infant to roll on the carpet, &c.

SLEEP.—For the first month an infant naturally, when in health, sleeps nearly two-thirds of its time—afterwards rather less; but during the whole period of infancy it should be allowed to sleep twelve hours, or nearly, out of the twenty-four. While speaking of this subject, it is well to observe that an infant in health should not be taken out of bed in the night, save to be *changed* when required. It should not be carried across the floor to lull it to sleep, nor spoken to or be allowed to look upon the light of a candle to please it; by so doing it will acquire a bad habit of waking in the night, injurious to itself, and troublesome to its attendant. It is not necessary to feed a child during the night, even when still being nourished at the breast. A mother who manages well will soon bring her little one into the habit of taking the breast immediately before going to sleep, and not again until morning.

The night clothes of the infant should be loose. Nothing can be worse than the custom of confining the limbs during the night.

When the child sleeps in the day, it may be laid in the bed or crib; but at night, at least for some months, it should sleep with its mother, whose bosom is its best and natural resting-place. Nothing can be more cruel than to banish a sickly or delicate infant to a cot or crib during the night, there to wail and cry for lack of that heat which it cannot itself engender, and which its mother's bosom would impart: the reason often given for the use of the crib is, that the parent fears to *overlay* the infant. But the young mother soon becomes so accustomed to the presence of the child, that its slightest movement is perceived, even while she sleeps, and she will even alter its position without herself waking.

After the infant is five or six months old, especially in warm weather, it will generate enough heat, and may then sleep in a cot by the bedside.

It is too much the custom to give some nostrum or other to infants to procure sleep. They all contain opium in some form or other, and are very injurious to the infant, and ofttimes fatal. No *soothing* medicine whatever should be given to an infant, without it has been prescribed for the particular case by a medical man. Avoid all "soothing syrups." They save the nurse much trouble, but they cost the infant's health, and perhaps its life.

OF ARTIFICIAL NURSING.

If it unfortunately happens that a mother cannot suckle, and is unable to procure a proper person to whom to dedicate the maternal office, it becomes requisite to consider what is the best food for an infant thus situated. It should of course be, especially in the earlier months, as nearly like the milk of the mother as possible.

The milk of different animals varies much in the *quantities* of their component parts, though they all consist of cream, curd, sugar, and whey; thus there is more cream in the milk of the human female than that of the cow, and also more sugar and whey.

Whatever food is given to an infant for the first six months should be very thin, and not much sweetened. After the teeth are all cut, solid food may be given, as rice pudding, &c.; very little animal food should be given during childhood. Those children thrive best who have but little.

After the first teeth are cut, the child may have a light-boiled egg or a little calf's-foot jelly, and may also drink new milk and water.

WEANING.

This, with all infants, is a most important epoch in their existence, and frequently gives rise to disease if not conducted with great caution. It is difficult to fix a period when weaning should be attempted; but it never should be done suddenly. The child should be prepared for the change by having, about the sixth month, some artificial food given it—at first once or twice a day, and afterwards oftener; so that it becomes *weaned from the breast in the day*, and has recourse to it only in the night. Let the process be accompanied with gentle carriage in the open air, if the weather is mild.

Though, as before remarked, it is difficult to fix a precise time for weaning, most authors agree that after the tenth month of lactation the milk becomes deteriorated, and unfit for the infant; besides, after that time the mother's health, as well as that of the babe, will suffer by continuing the practice. It may therefore be cited as a general rule, that the infant should be weaned by or soon after its second birthday, provided it be in good health; if not, the breast must be continued until the child is better. When an infant is cutting one or more teeth, it is not a favorable time to wean.

ON THE DISEASES OF INFANCY AND CHILDHOOD.

By infancy is to be understood the period of time extending from birth to the cutting of the last tooth of the first set of teeth, or about two years and a half.

Imperforations of various natural passages may take place, as imperforated *anus* (the lower bowel), nostril, eyelid, urethra, sexual organs of the female, &c.; or they may be malformed, or the exit of the natural evacuations may take place from unnatural openings. These all call for the immediate aid of the surgeon.

NEVI MATERNI (MOTHER'S MARKS) may be on any part of the body. When merely discolorations of the skin, and not elevated, they are not dangerous, but seldom admit of cure. But when they are elevated, and of a purple color, and grow rapidly, an operation becomes needful for their removal; as they might burst, and cause so great a loss of blood as to prove fatal.

DISTORTIONS OF VARIOUS PARTS OF THE BODY, AS CLUB-FOOT, &c., are not uncommon. They are to be treated by careful bandaging, &c., under the direction of a surgeon.

TONGUE-TIE may be known by the child not being able to suck. It is occasioned by the *frænum* or bridle of the tongue being attached too near the lips, and requires a simple operation for its removal.

HARE-LIP is well known. If the child cannot suck in consequence of the cleft, an operation must soon be performed, though always attended with danger to very young infants. If it can take the breast freely, the operation had better be deferred for a year or more.

MALFORMATION OF THE HEART, if considerable, often shows itself as soon as the child begins to walk. The skin of the child is dark, and looks dirty and leaden; the nails and lips are blue and livid; the breathing is difficult; there is a kind of asthmatic, suffocating cough, and sometimes convulsions. When cough and convulsions arise there is danger; but persons so affected have lived to adult age, and then died suddenly. There is no remedy in medicine for this disease; but all excitement of body and mind should be avoided, the child should have rest, its bowels are to be kept open, and care taken that the stomach is never overloaded with food.

DYSURY (difficulty of passing water) is to be relieved by warm fomentations, and a drop or two of sweet spirits of nitre.

INCONTINENCE OF URINE (inability to retain the water), especially in bed, is generally incurable until towards puberty. The best remedies are those that strengthen the habit of body, as country air, exercise, and sea-bathing.

EARACHE is a frequent and painful disease, both of infants and children. If too young to tell what ails it, it may be suspected by its being seized with a sudden and severe fit of crying as if it had colic, and like it the pain seems to be easier at times, but it does not, as in colic, *spur* with its feet, nor is its belly hard; but the head is restless, and it complains if the ear is touched. In time the child sobs itself to sleep, and in the morning perhaps its cap is found stained by matter. Heat is the best remedy; a warm poultice or warm oil should be applied to the ear, and the back of the ear should be rubbed with warm laudanum. If there is a fœtid discharge, the ear should be syringed carefully and gently every day with warm milk and water, and the bowels well opened. Some children, whenever they take cold, have a discharge from the ear, and are deaf. In this case the ear should be kept warm and frequently syringed, and the back of it rubbed with a little hartshorn and oil.

Ophthalmia, or Inflammation of the Eyes.—This disease may arise from exposure to a fire soon after birth; it then generally disappears in two or three days by washing with milk and water. But it may be what is called purulent ophthalmia, which is a very severe disease, and may cause loss of sight. It begins with a redness of the eyelids, which soon swell so that they cannot be opened, and discharge a large quantity of yellow, greenish matter, which excoriates the cheek. If allowed to continue, the globe of the eye becomes involved and dissolved, and the humors of the eye come away. It requires a very complicated treatment, which should be conducted by a skilful surgeon.

Eruptions, almost endless, attend teething, but are of little consequence if unattended by fever.

Infants who have artificial nourishment or bad milk are subject to troublesome successive crops of inflamed pimples, which slowly gather and burst, and form brown scabs which fall off. They may be on any part of the body, and sometimes are large enough to be called boils.

Excoriations Behind the Ears take place during dentition. If slight, they only require to be kept well washed with milk and water, and covered with lint spread with simple ointment. If the discharge of matter is great, they should be washed with two grains of sulphate of zinc dissolved in an ounce of water. They should not be healed quickly, without the child is well purged. Sometimes the ulcerations are so severe and extensive that the irritation causes convulsions; even mortification may ensue. If, therefore, they assume a very formidable appearance, a medical man should be called in.

Teething.—Generally, the first teeth cut the gum from about the sixth to the eighth month; but some very delicate or rickety children have no teeth until a year and a half old. The two middle front teeth appear first, and in about a month the two opposite ones; then two side teeth in front, both above and below; about the twelfth or fourteenth month the first double tooth appears; about the sixteenth or twentieth month the eye-teeth appear, and from that period to the thirtieth month the back double teeth come through. The child is about two years and a half old when it has all its first set of teeth, twenty in number. These continue to the sixth or seventh year, when they begin to fade and fall out, to make room for the permanent set.

DIARRHŒA, OR PURGING, is often very severe, and at some seasons of the year fatal. In this disease the stools are of various appearances; as green, curdled, &c. Sometimes it is attended with inflammation and fever. It is common during the time of dentition.

When it does not proceed from dentition it generally arises from improper food, and the diet should be attended to. If the infant is at the breast, it should, if possible, have a change of breast, especially if the nurse has been out of order; and the diet of the mother or nurse should be attended to. The infant's strength is to be supported by beef-tea, animal jelly, &c.

WORMS.—These are of various kinds, and give rise to numberless morbid feelings and symptoms. There is pain in the belly, purging, variable and voracious appetite; the child is always hungry, has a bad breath; its complexion becomes pale, its lips swelled, a livid circle surrounds its eyes, the belly swells, and its sleep is disturbed; the child wakes terrified, has a dry cough, picks its nose, has a slow fever, occasionally headache, sometimes convulsions, and frequently grinds its teeth. Worm medicines are numerous, but more benefit is derived from a proper attention to the general health than any other plan.

WHOOPING-COUGH. — This troublesome disease is familiar to nearly all mothers and nurses. It is characterized by paroxysms of a peculiar cough, most severe at night. Being a contagious disease, few children escape it, and it generally occurs but once. When uncomplicated with other complaints it is seldom a dangerous disease, and exhausts itself in six or eight weeks. A great variety of remedies are recommended for whooping-cough, and in the hands of an experienced physician there are some remedies that doubtless exercise a very beneficial influence. Advice should be sought in all cases of this malady, as it is very important to guard against dangerous complications. In the meantime the child should be kept warm and the skin moist.

CATARRH (Common Cold).—Infants are subject to catarrh, either common or epidemic. There is fever and inquietude, redness of the cheeks, watery discharge from the eyes and nostrils, disposition to sleep, panting and shortness of breathing, with frequent cough, but not severe. It generally goes off in a week by gentle purging, saline medicines, and the use of the warm bath.

BRONCHITIS—INFLAMMATION OF THE BRONCHIA, OR AIR TUBES OF THE LUNGS—is far from being uncommon; it begins with cough, and a good deal of phlegm is secreted, which the child swallows. The cough is frequent and comes on in fits; it is a *stifled* cough, and somewhat hoarse or shrill. The breathing is difficult, and on putting the ear to the chest a rattling is at times heard. Vomiting often takes place, the pit of the stomach is full, the stools are bad, the face pale, and the child sick and dull. It will take the breast, but no other food; the breathing becomes more and more difficult, the child appears choked with phlegm, the feet and hands swell, the body is emaciated, the cheeks in the evening are flushed, the cough is severe, and death ends the painful scene. Advice should be sought and followed as early as possible.

CROUP.—The form of croup most common, and often the most alarming to mothers, is marked by severe paroxysms of noisy and difficult breathing, and a peculiar cough. It generally begins by a cold or sore throat, and the attacks take place towards night. The child will appear well again the next day, and be up and running about as usual. There is rarely much danger in this variety of croup; and all that can be done is to relieve the paroxysm by warm baths, hot-water applications to the throat externally, the inhalation of vapor from hot water, and sometimes the administration of emetics.

The other variety of croup is a very different and a very fatal disease. It begins by cough or catarrh and grows gradually worse, the patient becoming rapidly prostrated. The inspiration is difficult and noisy, and the voice is often entirely extinguished. A peculiar membrane is formed in the throat, and that alone may cause death by suffocation. There is no remission in the symptoms, and the voice once lost does not return during the disease, which lasts from four to ten days. The child may die early from shock, or from the false membrane, which sometimes extends downwards and gives rise to bronchitis.

No time should be lost in obtaining the best possible advice, for under the ablest treatment nearly three-fourths of these cases prove fatal. It is *not* advisable to give emetics, because of their depressing influence; but great benefit is often derived from the inhalation of vapor from hot water, by means of which the air breathed by the patient should be kept constantly moist. When there is imminent danger of suffocation, the operation of opening the windpipe will sometimes save the patient's life.

The dress of children should be in some measure regulated by the season of the year; but it should always be easy and warm.*

Children should be allowed to run about much, and be in the air the greater part of the day. They can hardly take too much exercise.

Parents should not be over-anxious to commence the work of education. Many children are ruined in health, bodily and mentally, by the hot-bed system of education now in vogue. It is better that little creatures of four, five, or six years of age should be *dunces*, than that they should have their bodily vigor lost, and their mental energy in after life endangered by being employed in the school-room, undergoing the process of manufacturing into precocious prodigies, when they should be roaming free as the air in the green fields and pleasant woods.

The diet of childhood should be simple, and consist for the most part of good bread, potatoes, meat, and milk. Much fruit or many cakes and sweetmeats are injurious, as also are all wines, ale, porter, &c., in however small a quantity. Attention should be paid to the bowels of children; they should generally have two evacuations a day.

The true way, then, to have healthy children is to keep them clean and warm; give them plenty of air and exercise; few sweetmeats; sufficient, but not overmuch plain food; and attention to the bowels. If these hints are acted upon, the visits of the medical attendant will be much curtailed in number, and the health of children greatly improved.

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* INFANT MORTALITY.—*From Report of the Metropolitan Board of Health of New York.* "The records of infant mortality demand something more than a merely statistical analysis; but we have to confront the fact as it is daily registered on the death roll, that in these cities more than 32 in every 100 deaths are those of nurslings that have not reached their first birthday, and that 52 out of every 100 deaths are of children that have not reached their fifth birthday. Certain it is that nearly ten per cent. of all children born in our cities are constitutionally and organically too frail and imperfect to survive the ordinary physical adversities through which they must pass during the first five years of existence. But there is another class of inevitable causes of child mortality which the vital statist and hygienist must carefully study. It is that class which kills by cholera infantum and bowel congestions in the summer, and by lung diseases and convulsions in the cold season. Individually considered, most of these deaths seem to the medical attendant to be inevitable; but if we consider them with regard to their chief causes they plainly appear to be due to preventable circumstances."

PRESCRIPTIONS.*

The Doses prescribed under these Prescriptions are designed for adults.

The Rules for graduating Doses according to the age of children, and also for measuring medicines, are given on page 460.

CATHARTICS AND APERIENTS.

MEDICINES belonging to this class have the property of exciting the bowels to increased action, and in this manner promoting an evacuation of their contents. The medicines arranged in this class are very numerous, but they are not by any means all alike in the mode in which they effect the common result. While some strongly excite the intestines, and especially the muscular coat, others seem to direct their energy almost entirely to the mucous membrane with which they are lined. There are also other peculiarities in their action that it is useful to bear in mind. While some expend their chief force upon one division of the bowels, others select a different division over which to exercise their influence; while still others act with very nearly equal power upon the whole extent. It is apparent from these facts, that it is not always enough to know that the general action of a cathartic is to purge the intestines; it is useful also to know its specific virtues, and to be able to determine in advance whether it is the one that is most likely to execute the end proposed in the most salutary manner.

By taking a sufficiently large dose, purgative effects may be obtained from all, but the effects will not in all cases be equally efficient. If, for example, we select aloes, the action of which is almost wholly on the lower section of the alimentary passage, its operation will manifestly be very slow, because it can scarcely be felt until it reaches that portion of the intestines where it is most active. If it passes through the upper portions without producing commotion, it is evident that evacuations obtained by its use will be chiefly from the lower, and therefore the general purgation of the bowels must be incomplete. It is not only ineffective, but it at the same time produces disagreeable, uneasy sensations, that may be avoided by using the remedy combined with other ingredients which may either assist or modify its properties. Thus, for instance, such being the effect of aloes, if we take rhubarb, which acts most energetically on the smaller and upper intestines, and add these two together, we have produced a compound medicine that acts pleasantly on every part of the digestive tube, and accomplishes all that may be expected of a thorough purgative.

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* The prescriptions which appear in the course of the description of the principal diseases are not repeated here.

Some cathartics stimulate the mucous membrane with so much moderation, that they appear to do no more than cause an evacuation of the bowels—resembling greatly the simple motion of nature alone. Among such may be reckoned castor-oil, sulphur, and rhubarb. Others act with more intensity, and promote copious watery secretions. Salts and many others belong to this rank. There are still others, such as podophyllin, that have a more complex action, and expend part of their force upon distinct organs, and excite secretions in distant parts; if in this way the liver be much aroused, a large quantity of bile will be poured into the upper intestine, which, possessing aperient properties itself, assists the operation of the medicine.

Cathartics are divided, for the sake of convenience, into three heads. 1st. *Aperients;* 2d. *Purgatives;* 3d. *Hydragogues.* The first, sometimes also called Laxatives, act very gently. The second act briskly, and cause a number of copious motions. The third act violently, and cause a large number of motions that are but little else than water. Each kind is appropriate to certain conditions of the system and particular diseases.

There is no question that cathartics have been terribly abused, especially in the treatment of diseases of debility. Nervously exhausted patients need to be built up, and not pulled down. They need tonics more than cathartics. The tendency with dyspeptics is to use cathartic medicine too freely.

Some medicines of this class, when given in large doses, operate with great intensity, but their effects rapidly subside, and leave the bowels in much the same condition that previously existed. Some others are more decidedly irritating, and in large doses produce inflammation of the stomach and intestines. It is proper, therefore, to bear in mind that excessive doses are to be guarded against; and when such seem to be demanded, it is advisable that they be used under the direction of a professional man.

DECOCTIONS. INFUSIONS, MIXTURES, &c.

Infusion of Senna, Salts, &c.

Take of senna, half an ounce,
Epsom salts and manna, of each an ounce,
Fennel seed, a drachm,
Boiling water, half a pint.

Let it stand until cold; strain. One-third may be taken for a dose, and repeated in three or four hours after, unless it has operated well. This is a mild and very certain medicine, and is especially useful in *diseases of excitement.* It is an excellent cathartic to follow the use of calomel.

Infusion of Pink Root and Senna.

Take of pink root, half an ounce,
Senna leaves, half an ounce,
Boiling water, one pint.

Let it stand for two hours in a covered vessel, and strain. The dose for a child two or three years old is from four teaspoonfuls to two tablespoonfuls, morning and evening. This is an excellent remedy for *worms.*

If a teaspoonful or two of the tincture of rhubarb be added to the dose, it improves the effects when the bowels are flatulent.

Mixture of Tartrate of Potash and Manna.

Take tartrate of potash, half an ounce,
Manna, one ounce,
Warm water, three ounces,
Cinnamon water, half an ounce.

Mix them, and take half for a dose, which may be repeated at the end of three hours, if the bowels have not been sufficiently moved.

This is a mild aperient, cooling in its effects, and may be advantageously used in *fevers.*

Castor-Oil Mixture.

Take castor-oil, one ounce,
Gum arabic, two drachms,
Peppermint water, one ounce.

The oil and gum should be well rubbed together, and the mint water added to them gradually. The whole may be taken for a dose. When there is irritation of the bowels, and it is necessary to employ a purgative, nothing can be milder and more suitable than this. To have still gentler action, part of the above may be taken at a time.

Olive Oil.

Take a gill of this oil, or more, in the *colic* of *painters.* It is said by painters who use it to act like a charm.

Epsom Salts with Colchicum.

Take of Epsom salts, four drachms,
Calcined magnesia, thirty grains,
Wine of colchicum, eighty drops,
Mint water, five ounces.

This is to be divided into four equal doses, one of which, after the bottle is shaken, may be given every six hours, in *rheumatism* accompanied with fever.

Mixture of Turpentine and Castor-Oil.

Take oil of turpentine, two drachms,
Castor-oil, one ounce.

Mix. Take all for a dose. This makes an excellent purgative when quick and decided action is required, as in *affections* of the *brain.*

Cream of Tartar.

Take of Glauber salts, six drachms,
Cream of tartar, two scruples,
Boiling water, sufficient to dissolve the salts.

The cream of tartar disguises the bitter taste of the salts very much, and makes a pleasant medicine that sits well on the stomach. If a laxative effect only is desired, the half of the above quantity is sufficient for a dose. If free action is needed, take the whole of it. It may be used in any *inflammatory* disease, when the system requires reducing. If preferred, Epsom salts may be substituted for the Glauber.

Mixture of Syrup of Rhubarb and Soda.

Take aromatic syrup of rhubarb, four ounces,
Bicarbonate of soda, thirty grains,
Water, one ounce.

Mix. Dose: thirty to sixty drops, according to age, in the *bowel complaints* of children, so common in summer.

Mixture of Magnesia, Rhubarb, &c.

Take of calcined magnesia, half a drachm,
Powdered rhubarb, one drachm,
Powdered white sugar, one drachm,
Essence of peppermint, six drops,
Water, one and a half ounce.

Mix. A teaspoonful to be given every two hours to young children when they need an aperient, especially during the period of suckling and teething. It corrects the *acidity of the stomach.*

Decoction of Prunes.

Take of prunes three ounces,
Water, three pints, boil to two pints. Drunk as a cooling laxative.

Confection of Senna.

Take of senna, eight ounces,
Coriander seed, four ounces,
Liquorice root, bruised, three ounces,
Figs, one pound,
Pulp of prunes, half a pound,
Pulp of tamarinds, half a pound,
Sugar, two pounds and a half,
Water, four pints.

Rub the senna and coriander together, and separate ten ounces of the powder with a sieve. Boil what remains with the figs and liquorice root, in the water, down to one half; then press out the liquor, and strain it. Evaporate the strained liquor, by putting the vessel containing it into another vessel of boiling water, to a pint and a half; then add the sugar and form a syrup. Finally, rub the pulps gradually with the syrup, and having thrown in the sifted powder, beat the whole together until they are thoroughly mixed. If the prunes and tamarinds are too dry for such use, they may be boiled in a small quantity of water to soften them, pressed through a hair sieve, and evaporated to a proper consistence.

This is an excellent and most agreeable laxative, and is well adapted to cases of habitual *constipation* in pregnant women and persons suffering from *piles.* When the object is merely to give gentle action to the bowels, it may be used in almost any condition of the system. *I repeat what I have previously stated, that these laxative medicines are all much abused, especially by dyspeptics.* (See *Dyspepsia.*)

PILLS.

Pills of Rhubarb and Aloes.

Take powdered rhubarb, half a drachm,
Aloes, twenty-five grains,
Castile soap, half a drachm,
Simple syrup to make the whole into a suitable mass.

Divide into twenty pills; two for a dose. This makes a very good aperient, and is suitable for *sluggish bowels* that habitually demand medicine. The best time for taking them is on going to bed.

Rhubarb Pill.

Take powdered rhubarb, one drachm,
Powdered ipecacuanha, one scruple,
Syrup, sufficient quantity to make into pilular mass.

Divide into twenty pills. One may be taken at bedtime, in *costiveness;* this is peculiarly mild.

Pills of Rhubarb, Iron, &c.

Take powdered rhubarb, ninety grains,
Sulphate of iron (green vitriol), thirty grains,
White soap, two scruples,
Water, enough to make a mass.

Dose: three or four at bedtime. This pill is intended to remove *costiveness.* They are most properly applicable to *pale* and *debilitated* patients.

Pills of Croton Oil.

Take of croton oil, one drop,
Crumb of bread, enough for four pills.

Mix them together and divide. Dose: one every hour until they operate. This is a very powerful medicine, but if taken in a proper dose acts kindly.

Elaterium Pills.

Take calomel, five grains,
Elaterium, one fourth of a grain,
Compound extract of colocynth, four grains,
Cayenne pepper, one grain.

Mix, and divide into two pills. To be taken night and morning in *dropsy.*

Another Elaterium Pill.

Take extract of gentian, five grains,
Extract of elaterium, half a grain.

Make a pill: one is to be taken every hour until liquid stools are obtained. In *dropsy.*

Dandelion Pills.

Take extract of dandelion, thirty grains,
Calomel, six grains.

Mix. Divide into ten pills. Dose: two are to be taken three times a day. Useful in *dropsy* of the belly from obstructions in the liver.

POWDERS.

Powder of Rhubarb and Magnesia.

Take powdered rhubarb, four drachms,
Calcined magnesia, six drachms,
Powdered ginger, two drachms.

Mix. Dose: two teaspoonfuls. This is a good remedy in *dyspeptic* headache, when the stomach is suffering from *acidity.*

Powder of Sulphur and Cream of Tartar.

Take of sublimed sulphur, four drachms,
Cream of tartar, one ounce.

Mix. Dose, for children, a teaspoonful, and for adults, a tablespoonful, mixed in molasses or syrup, three times a day. This will be found very serviceable in *piles*; some diseases of the skin, as *itch*; and by reducing the quantity of cream of tartar to two drachms, it affords a very valuable remedy in *chronic rheumatism.*

Seidlitz Powders.

Take tartrate of soda and potash, two drachms,
Bicarbonate of soda, two scruples.

Make one powder.

Take powdered tartaric acid, twenty-five grains.

The two powders are to be dissolved in separate tumblers, each about one-third full of cold water. Pour one into the other, and drink while they are effervescing.

This is an aperient very grateful to the stomach, and will often quiet *nausea* when other medicines would be rejected.

Powder of Sulphate of Potash, &c.

Take sulphate of potash, sixty grains,
Powdered rhubarb, forty grains.

Divide in six equal parts, and take one twice a day in syrup. Useful in *dyspepsia*, and when the bowels are sluggish.

ENEMATA, OR PURGATIVE INJECTIONS.

The quantity of fluid proper for different ages is about four to six ounces, for a child between one and six years of age; a half a pint for the age between ten and fifteen years; and a pint or more for an adult.

Injection of Senna and Epsom Salt.

Infusion of senna, one pint,
Epsom salts, two drachms.

Use one-half of the quantity at a time.

Injection of Castor Oil, Molasses, and Salt.

Castor oil, two ounces,
Molasses, two ounces,
Common salt, one ounce,
Flax-seed infusion, one pint.

Injection of Table Salt.

Take of table salt, a tablespoonful,
Tepid water or gruel, one pint,
Sweet oil, a tablespoonful.

All to be used at once for an adult.

Injection of Epsom Salts.

Take of Epsom salts, an ounce and a half,
Tepid gruel, one pint,
Turpentine, one tablespoonful.

This is more powerful than the preceding. It may be used in preference to the other when the head is much affected, as in *apoplexy* or *convulsions.*

Injection for a Child.

Take of warm gruel, five ounces,
Table salt, two teaspoonfuls,
Sweet oil, six teaspoonfuls.

If the bowels contain much wind, or if there be convulsions, add a teaspoonful or two of turpentine.

Almost any of the purgatives may be used for injections, in the proportion of three times more than is necessary when taken by the mouth. Common sea-water makes as good a purgative injection as can be compounded when the object is merely to open the bowels. In many cases, a *large* injection of water alone is sufficient when the intention is merely to obtain a motion for the relief of ordinary constipation. In such cases, water at the temperature of 60 degrees is better than if it is warmer, as it imparts tone to the lower intestines, and thus diminishes the necessity of resorting to artificial means for relief.

Injections of the Nasal Passages.—Douches.

(See *Catarrh* and *Nasal Douches.*)

Douche of Common Salt,

Used in all stages of catarrh.

Common salt, one ounce,
Tepid water, one pint.

Douche of Chlorate of Potash.

Used for all stages of catarrh, but especially for the *acute* forms.

Chlorate of potash, one drachm,
Tepid water, half a pint.

Douche of Carbolic Acid.

Used for *chronic* catarrh.

Carbolic acid, five drops (or grains when solid),
Tepid water, one pint.

These douches are designed for domestic use. Too much dependence is placed on them. Patients afflicted with *chronic* catarrh should obtain medical advice at the same time. When no advice can be obtained, these simple douches are excellent means of relief.

Injections for the Nasal Passages.

(See *Catarrh* and *Posterior Nasal Syringe.*)

These injections are made behind the soft palate, and the fluid comes out through the nose.

Injections of Chlorate of Potash.

Used as a specific for *acute* colds in the head.

Chlorate of Potash, one drachm,
Tepid water, one ounce.

Injections of Carbolic Acid.

Used for *chronic* catarrh.

Carbolic acid, two drops (or grains when solid),
Tepid water, one ounce.

Injections of Nitric Acid.

Used for *chronic* catarrh.

Nitric acid, two drops,
Tepid water, one ounce.

Injections of Permanganate of Potash.

Permanganate of potash, one grain,
Tepid water, four ounces.

Patients ought not usually to make these injections for themselves, until at least they have received instructions from a physician. Each case must be studied by itself.

EMETICS.

This is a class of medicines that act especially on the stomach, and cause it to discharge its contents by vomiting. There are a large number of medicines which are capable of producing such effects, if given in sufficient doses, but many of them are uncertain in their operation, or violent in their action. Those of this character are not usually employed as emetics, and those only we recognize as belonging to the class, the action of which is prompt, moderate, and which generally follows a uniform dose. Most of the cathartics, under peculiar conditions, may cause nausea and vomiting; and we often experience difficulty in administering them, on account of the disturbance they excite in the stomach. Whatever is capable of irritating the stomach is also capable of acting as an emetic. But some medicines appear to be more disposed to affect the stomach than others, and they seem inclined to operate on this rather than on other organs.

Before administering emetics, the condition of the patient ought carefully to be considered. Emetics are improper in rupture, pregnancy, or in any case in which a strong physical effort might cause injury. They should not be resorted to when there is inflammation of the stomach; nor can they be given with propriety when there is great exhaustion of the powers of life.

If the vomiting is excessive, the means which are efficacious in allaying it when induced by disease may be had recourse to, and will prove equally useful at this time.

Stimulants applied over the region of the stomach, of which perhaps the best is a mustard poultice, will usually afford relief. A little brandy and water, spiced; a little cold tea; a teaspoonful of camphor-water occasionally given; a tablespoonful of lime-water, and the same quantity of milk, mixed together and drunk cold, every fifteen minutes; an effervescing draught, made by adding two teaspoonfuls of lemon-juice, or ten grains of tartaric acid to twelve grains of thé bicarbonate of potash or soda; a little oxalate of cerium or bismuth; or, finally, small quantities of cold iced water, or small bits of ice to dissolve in the mouth, will generally accomplish the object for which they are given, and check the violent throes of the stomach.

To promote vomiting, large draughts of warm water or camomile tea; or tickling the inside of the mouth with a feather, as far back as can be reached with the finger, will be found of service in assisting the action of the medicine.

MIXTURES, &c.

Hive Syrup.

Take compound syrup of squills, one ounce.

Ten drops may be given to a young child, and the dose should be increased with age, and repeated every twenty or thirty minutes.

This is a remedy of great celebrity for children having the *croup*, or an affection of the throat resembling it.

Mustard.

Take of powdered mustard, one drachm,
Warm water, half a pint.

Mix, and swallow it all at one draught. This produces prompt vomiting, and is a good emetic.

Solution of Table Salt.

Take of table salt, one tablespoonful,
Warm water, half a pint.

Dissolve and drink it at once.

Like the preceding one, this is an emetic that is generally at hand, ready for any emergency. It is prompt in its action, and causes free vomiting without much retching. They both may be used in preference to others, when the *stomach* is *languid*, and the system is suffering from food that it is unable to digest, causing, often, *sick headache*.

POWDERS.

Powder of Ipecacuanha.

Take the powder of ipecacuanha, two scruples.

This is to be divided into two doses, one of which may be given mixed with syrup or molasses, and succeeded by a tumblerful of warm water. If one powder does not answer, in twenty minutes the second may be taken in the same manner.

This is one of the most useful emetics that we possess. It is always safe to give it, when, from the tendency to irritation in the stomach, many other substances of this class might do injury. There is, besides, but little danger of administering too much; for whether twenty grains, or fifty, or one hundred be taken, the first effect of vomiting will bring most of it up again, so that the subsequent effects will not be much varied by the quantity.

Powder of Sulphate of Copper.

Take of sulphate of copper, two grains.

Give it in a little syrup and water.

This medicine is very rarely employed for this purpose, except in cases of poisoning, when the sensibility of the stomach has been greatly impaired, and after other articles have failed. It should be followed immediately with a large draught of warm water.

Powder of Sulphate of Zinc.

Take sulphate of zinc, fifteen grains.

Mixed with syrup or molasses: all of it should be taken at once, if strong effects are desired, as in *poisoning*. Copious draughts of warm water should immediately be drank upon it. It is supposed to act as a tonic to the stomach.

DIAPHORETICS.

This class of medicines act by promoting the exhalation of the surface of the body. It is a very important class of remedies, and is useful in a great variety of cases. The free action of the skin is always necessary to sound health; and if this be interfered with, as it generally is when the body is suffering from disease, it is a matter of much importance to have it re-established. Suddenly checking perspiration when the body is in health, as every one knows, is a very common cause of disease; and this commonly falls most heavily upon such organs as, either from accidental or hereditary conditions, are least able to contend with the changes that take place in consequence of the suppression of an excretion so essential to health. This is not a suitable place for an exposition of the physiological uses of the perspiratory functions; but when I state that the skin of a person of ordinary size daily exhales from two to five pounds—the quantity varying with circumstances—it will readily be inferred that it cannot be suspended with impunity, and that it has some great end to subserve.

To promote perspiration the patient should get into bed, and be moderately covered with clothing. Warm drinks freely used will also conduce to this purpose; and there are certain other methods by the application of artificial heat—as with hot bricks, bottles of hot water, hot sand-bags, hot vapor introduced under the bedclothes through a suitable tube, or hot air conducted to the body in a similar manner—that are often employed in particular exigencies.

In fevers it would be a great mistake to increase the external heat, whether by an increase of bed covering, or by warmth directly conveyed to the surface. In such cases the skin is already too hot, and it often happens that a reduction of the temperature is the best means for obtaining moisture. When the heat is great and the skin dry, the body should be cooled by withdrawing as much covering as may be necessary to lower the morbid temperature to that point at which the patient feels comfortable. Even sponging with cold water in many instances, when the warmth is very distressing, has been found good practice.

It often occurs, after diaphoretic medicines have been administered in vain, that cooling the surface by any such means as have been mentioned acts with magical power; and a remedy which previously was worse than useless will now cover the skin with a life-giving dew.

MIXTURES, INFUSIONS, &c.

Infusion of Herbs.

Take of marsh-mallow, one ounce,
Balm and spearmint, of each one ounce,
Elder flowers and arnica flowers, of each one ounce,
Anise seed, half an ounce.

Pour boiling water on it, and use as a common drink. May be advantageously drank in *colds* and *slight fevers.* It is useful to promote the action of other more powerful remedies of this class.

Mixture of Nitre, Ammonia, &c.

Take sweet spirits of nitre, three drachms,
Solution of acetate of ammonia, three ounces,
Nitrate of potash, two scruples,
Camphor water, four and a half ounces,
Lemon syrup, two drachms.

Mix. Dose: two tablespoonfuls every four hours, in *fevers.* Proportional doses to children in the collapsed stage, when the head is much affected, and they are inclined to *sleep.*

Mixture of Carbonate of Ammonia, &c.

Take carbonate of ammonia, half a drachm,
Camphor water, six ounces.

Mix. Dose: two tablespoonfuls every hour. Useful in *fevers* when the powers of life are low, and in *dropsy* when stimulants are needed.

Draught of Carbonate of Ammonia and Lemon-juice.

Take carbonate of ammonia, fifteen grains,
Fresh lemon-juice. half a drachm,
Water, pure, seven drachms,
Syrup, two teaspoonfuls.

Mix. Take all at a dose, and repeat it every six hours. This is a cooling diaphoretic, and may be given in *fevers* when the *skin is hot.*

Draught of Carbonate of Potash and Lemon-juice.

Take of carbonate of potash, one scruple,
Fresh lemon-juice, half an ounce,
Water, pure, one ounce,
Antimonial wine, twenty drops,
White sugar, one scruple.

Mix. Use as in the preceding prescription. It possesses more decidedly diaphoretic properties.

Infusion of Pleurisy Root.

Take of pleurisy root, one ounce,
Boiling water, one and a half pint.

Infuse. Dose: a teaspoonful to be taken warm as frequently as it can be borne by the stomach. This is considered a very good diaphoretic, and may be given in any case when fever is present.

Infusion of Boneset.

Take of boneset, one ounce,
Boiling water, one pint.

Infuse for half an hour. Dose: a wine-glassful every half hour, as hot as possible.

Infusion of Pipsissewa.

Take of pipsissewa (or winter green), two ounces,
Boiling water, one quart.

Infuse. Dose: a pint may be taken in the course of twenty-four hours. It is highly esteemed by some persons in *scrofula* before and after ulceration, in ill-conditioned *ulcers*, and in *cutaneous affections* connected with a scrofulous taint.

Infusion of Blessed Thistle.

Take of the leaves of blessed thistle, one ounce,
Boiling water, one pint.

Infuse. Dose: a wine-glassful, as frequently as the stomach will allow without vomiting, will produce copious perspiration, and may be used in slight *fevers* and *colds.*

Decoction of Sarsaparilla.

Take of sarsaparilla, sliced and bruised, six ounces,
Water, six pints.

Boil to four pints, and strain. Dose: a teacupful, four times a day. May be used in *skin diseases*, and *scrofula* complicated with *syphilis.*

Infusion of Virginia Snake-root.

Take of Virginia snake-root, one ounce,
Boiling water, two pints.

Infuse for two hours in a covered vessel, and strain. Dose: two to four tablespoonfuls every two hours in *low forms of fever*, when the system requires support. It is useful in *fever and ague*, and is frequently employed in *measles* when the eruption has receded, or is tardy in making its appearance. In this latter case it is best to give it warm.

Effervescing Draught.

Take of carbonate of potash, two drachms,
Water, four ounces. Dissolve.

Fresh lemon-juice, two ounces,
Water, two ounces. Mix, and keep in separate vessels.

Dose: two tablespoonfuls of the acidulated water is to be mixed with one of the potash solution, and the whole drunk while it is foaming. When lemon-juice cannot be obtained, eighty grains of tartaric acid dissolved in four ounces of water, a tablespoonful of which is to be used at a time, will answer as a substitute for it. This is a pleasant diaphoretic in *fevers*, and is admirable in allaying *nausea* and *cholera morbus*.

POWDERS.

Powder of Ipecacuanha and Opium.

Take of ipecacuanha, powdered, half a drachm,
Powdered opium, half a drachm,
Sulphate of potash, half an ounce.

Dose: ten or fifteen grains of this powder, known commonly as Dover's powder, may be given for a dose. It is an admirable diaphoretic and anodyne, and is applicable to all cases when the head is not affected, and the stomach will bear its use. It is especially useful in *rheumatism*, *inflammation of the lungs*, and other inflammatory affections. It is useful in *diarrhœa*, *dysentery*, and *bleeding* from internal organs. Ten grains of the powder contains one grain of opium.

DIURETICS.

Medicines of this class stimulate the kidneys and increase the secretion of urine. They act best when the skin is cool and the bowels are quiet. If there be active purging or copious sweating, the secretion of the kidneys will be very sensibly diminished. A medicine, therefore, possessing diuretic properties, if administered in quantities, or combined with purgatives, so as to produce a cathartic effect, will no longer excite the kidneys; and its influence will either be wholly lost, or directed to the bowels. When combined with diaphoretics, they in the same manner lose their specific properties, and either aid the medicines with which they are conjoined, in promoting the cutaneous exhalation, or answer no good purpose whatever. In compounding medicines, these facts should be kept in view; for an attempt to accomplish everything by uniting medicines having what may be called antagonistic actions, will only be successful in rendering the dose unnecessarily large, and often much more disgusting. The effect of diuretics is increased by drinking largely of water or any other bland fluid; but in some cases, as in dropsy, the object for which the remedy is taken would be defeated if the blood-vessels were kept full of water by large potations.

MIXTURES, DECOCTIONS, &c.

Mixture of Digitalis, Acetate of Potash, &c.

Take infusion of digitalis, three and a half ounces,
Cinnamon water, three and a half ounces,
Acetate of potash, two and a half drachms,
Vinegar of squills, three drachms,
Tincture of opium, ten drops.

Mix. Dose: two tablespoonfuls three times a day. May be used in any form of *dropsy.*

Mixture of Horse-Radish, Juniper, &c.

Take compound infusion of gentian, five ounces,
Acetate of potash, half a drachm,
Compound spirit of juniper, half an ounce,
Compound spirit of horse-radish, half an ounce,
Sweet spirits of nitre, two drachms.

Mix. Dose: two tablespoonfuls, three times a day. Useful in *dropsy,* when the system is much debilitated and requires strengthening.

Mixture of Squills, &c.

Take oxymel of squills, four drachms,
Hyssop water, three ounces,
Peppermint water, one ounce,
Sweet spirits of nitre, half an ounce.

Mix. Dose: two tablespoonfuls, three or four times a day. This may be employed in *coughs*, *asthma*, &c., of the lungs. Like the preceding, it relieves the lungs by acting on the kidneys.

Decoction of Bearberry.

Take of leaves of bearberry, one ounce,
Water, one pint.

Boil it until about one-fifth of the fluid is evaporated, and strain. Dose: two to four tablespoonfuls three or four times a day. Useful in *gravel*, *chronic inflammation* of the *kidneys*, *catarrh* of the *bladder*, and most other affections of these organs. It has also been very highly extolled by an English physician in *consumption of the lungs.*

Mixture of Nitrate of Potash, &c.

Take nitrate of potash (saltpetre), three drachms,
Peppermint water, ten and a half ounces,
Sweet spirits of nitre, three drachms,
Lemon syrup, one ounce.

Dose: one to two tablespoonfuls in *dropsy.*

Mixture of the Acetate of Ammonia, &c.

Take of the solution of the acetate of ammonia, two ounces,
Acetate of potash, two drachms.

Mix. Dose: a tablespoonful every three hours.

This may be given in *dropsical affections*, and in *gravel* when the deposit has a brick-dust color, evincing uric acid in the urine.

Infusion of Juniper Berries.

Take of bruised juniper berries, one and a half ounce,
Cream of tartar, one ounce,
Boiling water, one pint.

Infuse. Dose: a teacupful six times a day. Used in *dropsy.*

Infusion of Juniper Berries in Cider.

Take of juniper berries, half an ounce,
Mustard seed, half an ounce,
Ginger root, half an ounce,
Bruised horse-radish, one ounce,
Parsley root, one ounce,
Fermented cider, two pints.

Infuse. Dose: a wine-glassful may be taken three or four times a day. Useful in general *dropsy*, when stimulation is needed.

Mixture of Oil of Juniper, &c.

Take oil of juniper, eight drops,
White sugar, one and a half drachm,
Gum arabic, one and a half drachm,
Water, four ounces.

Mix. Dose: a tablespoonful every hour or two.

Solution of Cream of Tartar.

Take of cream of tartar, one ounce,
Boiling water, one quart.

Let it stand until it becomes cold, and then drink freely of it during the day. Very grateful when the system is inflammatory, and requires a little reducing.

Mixture of Balsam of Copaiba, &c.

Take copaiba, half an ounce,
Sweet spirits of nitre, half an ounce,
Gum arabic, powdered, one drachm,
Sugar, powdered, one drachm,
Spirits of lavender, two drachms,
Tincture of opium, one drachm.
Water, four ounces.

Mix. Dose: a tablespoonful three or four times a day. A remedy in *gonorrhœa*, a specific disease of the urinary organs.

Mixture of Oil of Turpentine, &c.

Take oil of turpentine, one hundred drops,
Gum arabic, powdered, two drachms,
Sugar, powdered, two drachms,
Peppermint water, four ounces.

Mix. Dose: a tablespoonful several times a day. Useful in disease of the *kidneys*, and when a *stone* is passing from the kidneys to the bladder; in *rheumatism*, and in *bleeding* from the stomach or lungs when there is no arterial excitement.

Infusion of Dandelion, &c.

Take infusion of dandelion, four ounces,
Extract of dandelion, two drachms,
Carbonate of soda, half a drachm,
Tartrate of potash, three drachms,
Tincture of rhubarb, three drachms,
Tincture of henbane, twenty drops.

Mix. Dose: one-third part to be taken three times a day. Good in *dropsy*, especially if it depends upon obstruction in the liver, and in *dyspepsia*.

Infusion of Dandelion.

Take of dandelion root, broken small, two ounces,
Boiling water, one pint.

Let it stand twenty-four hours, and strain. Dose: two tablespoonfuls, four times a day. Used in such cases as the preceding formula.

Decoction of Pipsissewa.

Take of pipsissewa (winter green), one ounce,
Water, one quart.

Let it soak for twelve hours, and slowly boil it down to one-half. Dose: a wine-glassful three or four times a day. In *dropsy*, in which there is debility of the stomach and bowels. It is also serviceable in *gravel* and disease of the *kidneys*, and has been thought particularly valuable in *scrofula*, and in some kinds of *eruptions* on the skin.

Infusion of Henbane.

Take henbane, one ounce,
Boiling water, one pint.

Let it infuse for twelve hours. Dose: the whole of this in one day. Useful in *inflammatory dropsy*, and in affections of the *urinary organs*.

Mixture of Calumbo, Æther, &c.

Take tincture of digitalis, one and a half drachm,
Tincture of calumbo, one and a half ounce,
Spirits of sulphuric æther, four drachms,
Laudanum, forty drops,
Camphor water, seven ounces.

Mix. Dose: two tablespoonfuls twice a day may be employed when the patient is low and the action of a diuretic is required.

EXPECTORANTS.

This class of medicines are designed to relieve the mucous membrane of the lungs, by increasing the secretion of mucus. In this way inflammation and congestion of the membrane is removed. Many remedies are expectorants under peculiar circumstances; thus even blood-letting, when the lungs are suffering from an inflammation of an acute kind, and the ordinary secretion is consequently suspended, may act as a remedy of this description. But there are certain medicines that more directly belong to the class of expectorants, and appear to have a kind of specific tendency to the lungs.

When expectorants are used, the body should be kept well protected from atmospheric changes, and from severe cold. The patient should also avoid, so far as possible, the breathing of cold air. If such precautions be neglected, the purpose for which the remedy is administered will be partially if not wholly defeated. *Expectorants are very much abused. They are expected to do far more than they are able to accomplish. Excessive use of them, especially in consumption, does but little good in the way of relieving the cough, and weakens the stomach.*

Mixture of Ipecacuanha Wine, &c.

Take of wine of ipecacuanha, three drachms,
Syrup of tolu, five drachms,
Powdered gum arabic, one drachm,
Water, one ounce.

Rub the gum and water first together, and then add the other ingredients. Dose: a teaspoonful every hour. For common *cold*, with tightness of the chest. In smaller doses this is a very good mixture for children.

Mixture of Syrup of Squills, &c.

Take of paregoric elixir, half an ounce,
Syrup of squills, one ounce,
Antimonial wine, two drachms,
Water, six ounces.

Mix. Dose: a teaspoonful every fifteen minutes, until the cough is relieved. For *influenza.*

Mixture of Paregoric and Ipecac Wine.

Take of paregoric elixir, two ounces,
Ipecacuanha wine, one ounce.

Mix. Dose: a teaspoonful occasionally, in a *dry cough* threatening consumption.

Mixture of Seneka Snake-Root, &c.

Take of seneka snake-root, three drachms,
Anise seed, three drachms,
Liquorice, two drachms.

Boil in eight ounces of water, strain, and add
Paregoric elixir, one and a half ounce,
Syrup of squills, one ounce.

Dose: a tablespoonful three or four times a day. This should be used in *cough* when there is no fever and the system is languid.

Mixture of Liquorice, &c.

Take of powdered extract of liquorice, two drachms,
Powdered gum arabic, two drachms,
Hot water, four ounces. Dissolve, and add
Antimonial wine, two drachms,
Laudanum, half a drachm.

Mix all together. Dose: a tablespoonful, to be taken occasionally in *influenza*.

Coxe's Hive Syrup.

Take of squills, one ounce,
Seneka snake-root, one ounce,
Water, one pint.
Boil down one-half, and strain. Add
Clarified honey, half a pound,
Tartrate of antimony, twelve grains.

Mix. Dose: ten drops to a teaspoonful, for a child, according to age. This is a celebrated remedy in *croup*, and may be advantageously used in other affections of the lungs.

Mixture of Gum Ammoniac, &c.

Take of gum ammoniac, one drachm,
Water, four ounces,
Dissolve by rubbing in a mortar,
Syrup of squills, two ounces,
Paregoric elixir, half an ounce.

Mix. Dose: a tablespoonful, four times a day. Useful in *chronic cough*, *asthma*, and other pectoral affections attended with a deficient expectoration, without acute inflammation, or when there is too copious an expectoration of mucus, caused by debility of the mucous membrane.

Tincture of Bloodroot.

Take of the saturated tincture of bloodroot, one ounce. Dose: twenty-five to forty drops, two or three times a day. Highly recommended in *consumption*.

Syrup of Bloodroot, &c.

Take of bloodroot, one ounce,
Anise seed, half an ounce,
Liquorice, half an ounce,
Boiling water, two pints.

Boil down to one pint, then add four ounces of honey. Dose: a tablespoonful, three or four times a day. In *consumption*, attended with *dyspeptic* symptoms, it may be used in preference to the preceding.

Infusion of Cherry Bark.

Take of wild-cherry bark, bruised, half an ounce,
Water, one pint.

Let it stand for twelve hours, and strain. Dose: a wine-glassf three times a day. It calms the pulse in the *hectic* of *consumpti* and acts as a *tonic* at the same time.

Mixture of Infusion of Wild Cherry.

Take of the infusion of wild cherry, one pint,
Ipecacuanha wine, one ounce,
Laudanum, two drachms,
Syrup, two ounces.

Mix. Dose: a wine-glassful, three times a day. Preferable, most cases, to the preceding, in *consumptive* diseases.

Tar Water.

Take of tar, one pint,
Water, four pints,

Stir them together in the most thorough manner, then let the settle, and strain the water off. Dose: a wine-glassful may taken four times a day. In *consumption.*

Infusion of Flaxseed.

Take of flaxseed, one ounce,
Liquorice root, half an ounce,
Boiling water, two pints.

Let it stand two or three hours near the fire, and strain. A what is agreeable to flavor. A common drink in *influenza.*

Decoction of Bran.

Take wheat-bran, one pint,
Raisins, mashed, half a pint,
Water, four pints,
Honey, six tablespoonfuls.

Simmer for three or four hours, and strain. Dose: a wine-gl ful four or five times a day, or it may be used as a common dri in *coughs.*

Mixture of Bitter Almonds, &c.

Take of mixture of gum ammoniac, three ounces,
Mixture of bitter almonds, three ounces,
Tincture of squills, forty drops.

Mix. Dose: three tablespoonfuls twice a day. In *dry, noa* cough.

PILLS.

Pills of Gum Ammoniac, Myrrh, &c.

Take of powdered gum myrrh, one drachm,
Gum ammoniac, half a drachm,
Powdered squills, ten grains,
Syrup, a sufficient quantity to make pills.

Divide in twenty pills. Dose: two, morning and evening. Useful in the *chronic cough* of the feeble and the old, when the lungs become loaded with mucus that the patient is unable to get rid of.

ANTHELMINTICS.

Anthelmintics, or vermifuges are medicines possessing the property of destroying or expelling worms from the intestinal canal. Many medicines are capable of accomplishing this result, but there is a class that specifically manifest such a power. It is customary to combine remedies of this class with some one or more of those having purgative action, by which means their effects are much improved. As the action of these medicines, however, is merely temporary, it is proper, as soon as the worms are dislodged, to employ means calculated to restore the digestive organs to a healthy condition, and to correct that peculiar state which favors their production. The means best adapted to this purpose are such as improve the general health. The body should be kept warm with suitable clothing; the diet should be nutritious; and, if necessary to invigorate by medical agency, bitter tonics, with gentle aperients, may be administered. In some cases, when the system is nearly bloodless, as is known by the pallid countenance, the preparations of iron prove to be the most suitable tonics that can be given.

It is perhaps more difficult to ascertain when worms exist in the stomach and bowels than it is to destroy them. It is very much the fashion to assume, whenever a child is mopish, that it is tormented with these vermin. Sometimes the conjecture proves to be correct, but more frequently it is wrong. Worm medicines in either case are had recourse to, and should there be no worms to rout, the chances are that the child will really be made worse by the quantities of remedies it is unhappily compelled to take.

We throw out these hints to save children from being unnecessarily tortured. If there be good reason for believing that a child has worms, and especially if any have been passed at stool, then the remedies of this class should be judiciously tried. But if the opinion is merely a doubtful guess, it is better, after making a moderate experiment, without any confirming result, to abandon their use, and, if necessary, take the advice of a physician. (See *Worms.*)

Decoction of Pomegranate.

Take of bark of root of pomegranate, two ounces,
Water, two pints.

Boil to one and a half pints. Dose: two ounces every hour. Three or four doses are generally sufficient to expel the worms. This is intended for the *tape-worm*, an animal of immense length, that is most common to adults.

Anthelmintics.

Used for worms.

Santonine, six grains,
Sugar, fifteen grains.

Mix, and divide into eight powders. To a child *five* years old give one powder night and morning.

Infusion of Kousso.

Used for tape-worm.

Kousso, half an ounce,
Boiling water, ten ounces.

Dose: four ounces every hour.

Emulsion of Pumpkin Seeds.

Used for tape-worm.

Pumpkin seed, two ounces.

Remove the shells and mix in a mass. Then add gradually eight ounces of water. Take the whole quantity in three doses.

Mixture of Turpentine.

Take of oil of turpentine, half an ounce,
Yolk of egg, one,
Peppermint water, two ounces.

Mix. Take all for a dose, for *tape-worm;* or it may be given in smaller doses, and repeated three or four times in twenty-four hours. This medicine is perhaps the best that can be used for any kind of worms. For a child between two and five years of age, a teaspoonful of oil of turpentine, mixed as directed, will be sufficient. Turpentine is less likely to act on the urinary organs when taken in a large dose than when taken in a small one, as it passes off through the bowels as a purgative. It may also be mixed with castor-oil. Thus, for a child,

Take oil of turpentine, half an ounce,
Castor-oil, one ounce.

Mix, and give three teaspoonfuls once a day.

Infusion of Pink-Root, &c.

Take of Carolina pink-root, half an ounce,
Senna, two drachms,
Manna, one ounce,
Fennel seed, two drachms,
Boiling water, one pint.

Let it infuse in a covered vessel for an hour, and then strain. A wine-glassful may be given to a child from two to four years old, three times a day. This is an excellent remedy against the common round-worm resembling the earth-worm.

Mixture of Worm-seed Oil.

Take of worm-seed oil, one drachm,
Sugar, one and a half drachm,
Gum arabic, powdered, two drachms.

Mix, and then add

Peppermint-water, two and a half ounces.

Dose: a teaspoonful three times a day for two or three days, then to be followed by some brisk cathartic. For children this is a good anthelmintic, and is much used in some parts of the Southern States.

Cowhage (or cowitch) and Honey.

Take of cowhage, one drachm,
Honey, sufficient quantity.

Mix well together. Dose: a teaspoonful to a child two or three years of age, given before eating in the morning, for three days in succession, and then followed by an active cathartic. This is a very good vermifuge for the common worm.

Aloes Injection.

Take of aloes, twenty grains,
Milk, four to six ounces.

Dissolve the aloes, and use it for an injection. This is suitable for the destruction of the *ascarides*, a little worm that generally inhabits the lower bowel in great numbers. For a child five to ten years of age.

STIMULANTS.

Stimulants are a class of remedies that excite, in a transie way, the vital powers. They increase the vigor of the body, a some of them exalt the intellectual faculties. They have differe modes of action, some producing strong effects on both the nervo and arterial systems, and arousing every organ of the body; whi others appear to affect more especially the brain, spinal marrow, a the nerves proceeding from them.

MIXTURES, &c.

Ammonia, &c.

Take of camphor water, six ounces,
Carbonate of ammonia, one drachm,
Sweet spirits of nitre, three drachms.

Mix. Dose: one tablespoonful may be taken frequently whe there is *fainting.*

Infusion of Mint, Camphor, &c.

Take infusion of spearmint, six ounces,
Burnt brandy, one ounce,
Paregoric elixir, one drachm,
Sugar, half an ounce.

Mix. Dose: a tablespoonful frequently taken until the vomiting ceases. To stop long-continued *vomiting* and *retching.*

Mixture of Sulphuric Æther, &c.

Take of sulphuric æther, one drachm,
Water, six ounces,
Oil of caraway, six drops,
Peppermint water, one ounce,
Sugar, three drachms.

Mix. Dose: a tablespoonful occasionally, in *flatulence* of th stomach.

Draught of Arnica, &c.

Take of arnica flowers, three drachms,
Boiling water, ten ounces,

Let it stand for an hour in a close vessel, and strain it; the add

Liquorice powder, one ounce,
Compound tincture of cardamoms, two drachms,
Syrup of ginger, one drachm.

Mix. Take this at a dose, and repeat it three times a day. I *paralysis.*

Milk Punch.

Used in typhus and typhoid fevers.

Brandy, two ounces,
Milk, four ounces,
Sugar to suit the taste.

Dose: a tablespoonful or more every hour or two.

Egg-nog.

One egg,
White sugar, two drachms.

Mix, and beat into a froth; then add

Sherry wine, half an ounce,
Water, one ounce.

This preparation is nutritious, tonic, and stimulating. Nutmeg may be added to suit the taste.

Mixture of French Brandy, &c.

Take of French brandy, four ounces,
Cinnamon water, four ounces,
Yelk of eggs, two,
Sugar, half an ounce,
Oil of cinnamon, two drops.

Mix. Dose: one to three tablespoonfuls, repeated every two hours when necessary. An excellent remedy in the debility consequent upon protracted disease, when the patient appears to be sinking from exhaustion.

Draught of Valerian and Ammonia.

Take of valerian, one scruple,
Carbonate of ammonia, ten grains,
Cinnamon water, two ounces.

Take the whole at once, and it may be repeated every fourth hour. In *nervous headache* and *low spirits.*

Infusion of Virginia Snake-Root.

Take of snake-root, half an ounce,
Boiling water, one pint.

Let it stand for four hours, and strain. Dose: two to four tablespoonfuls three times a day. Useful in low *fevers, fever and ague, gangrene, &c.*

Confection of Black Pepper, &c.

Take of black pepper, four ounces,
Elecampane root, four ounces,
Fennel seeds, twelve ounces,
Honey and white sugar, of each eight ounces.

Rub the dry ingredients together to a very fine powder, add four ounces of water, and beat into an uniform mass. This is a remedy that is known as Ward's Paste, and is very efficacious in *piles* when they occur in the weak and debilitated. Dose: mass as large as a hazel-nut, three times a day.

Balm Tea.

Take of fresh balm, two ounces,
Boiling water, half a pint.

Let it stand for a quarter of an hour. Dose: a wine-glassful to a teacupful, frequently. It may be drunk warm to promote the operation of sweating medicines. If the balm is dry, one-half the above quantity is sufficient. *Spearmint Tea* may be prepared in the same manner and proportions, and taken in half the dose of the balm tea.

Wine Whey.

Take of fresh milk, half a pint,
Madeira wine, one to two ounces.

Boil the milk and then add the wine. Used in *fevers* when the system requires support. It is a mild stimulant.

SOPORIFICS, NARCOTICS, ANODYNES, AND NERVINES.

The medicines of this class are very numerous, and for practical purposes in this place may embrace sedatives, anodynes, and soporifics. Most of them primarily produce a stimulating effect on the nervous and vascular systems; but this is soon succeeded by a depression of the vital powers and sleep. If the stimulating effect only be desired they should be administered in only small doses, and frequently repeated. When given with the intention of causing sleep, the dose ought to be larger, and repeated at more distant intervals. Some individuals are nearly insensible to their action, while others can scarcely endure the smallest quantities, becoming either stupefied or excessively excited.

Habit influences the action of narcotics on the system more than any other circumstance, their power being diminished in a remarkable degree by repetition; it is therefore necessary, where their continued use is required, gradually to augment the dose, in order to obtain their proper effects. *These are remedies that are very greatly abused.* (See *Sleeplessness.*)

NARCOTICS AND ANODYNES.

Anodyne Plasters.

Used for painful joints, backache, lumbago, &c.

Lead plaster, two drachms.

Melt, and add gradually

Powdered opium, half a drachm,
Powdered camphor, half a drachm.

Plaster of Opium and Camphor (used for neuralgia).

Powdered opium, half a drachm,
Powdered camphor, half a drachm,
Burgundy pitch, one ounce.

Mix with lead, as much as may be necessary.

Belladonna Plaster (excellent for neuralgia, backache, &c.).

Extract of belladonna, one drachm,
Glycerine, half a teaspoonful.

Mix, and spread on adhesive plaster.

NERVINES.

These have a calming, quieting influence on the nervous system. They produce sleep and allay irritability, and to a certain extent relieve pain.

Bromide of potassium, one drachm,
Syrup of orange peel and
Water, each three ounces.

Dose: from one to three or four tablespoonfuls.

Chlorodyne is made according to the following formula:

Chloroform, four drachms,
Sulphuric æther, two drachms,
Theraica, one drachm,
Mucilage of gum arabic, one drachm,
Muriate of morphine, eight grains,
Dilute hydrocyanic acid, two drachms,
Oil of peppermint, four drops.

Chlorodyne can only be made by a chemist. Other anodynes are sometimes added besides those mentioned. The dose is from five to ten drops. It is given in those cases where an anodyne is needed.

MIXTURES, DRAUGHTS, &c.

Draught of Henbane, &c.

Take of tincture of henbane, one drachm,
Camphor water, two ounces.

Mix. To be all taken at once at bedtime, and repeat it in two hours if the patient does not sleep. An excellent narcotic draught where from any cause opium is inadmissible.

Mixture of Tincture of Lettuce, &c.

Take of tincture of lettuce, six drachms,
Distilled water, six drachms,
Water of cherry laurel, two drachms,
Simple syrup, one and a half ounces.

Mix. Dose: a tablespoonful morning and evening. An anodyne draught, preferable to an opiate, in *consumption.*

Draught of Sulphate of Morphia, &c.

Take of sulphate of morphia, half a grain,
Diluted sulphuric acid, two drops,
Water, two ounces,
Syrup, half an ounce.

Mix. Take half of it at a dose for an adult.

Mixture of Foxglove, &c.

Take of tincture of purple foxglove, three drachms,
Camphor water, six ounces,
Orange syrup, one and a half ounces,
Prussic acid, six drops.

Mix. Dose: two tablespoonfuls two or three times a day. An excellent remedy in *nervous palpitations.* It is a powerful medicine, and must only be used with great care.

PILLS.

Pills of Morphia.

Take of sulphate of morphia, three grains,
Conserve of roses, sufficient to make pills, and divide into twelve.

Dose: one pill (which is equivalent to a grain of opium) when necessary.

Pills of Lettuce.

Take of extract of lettuce, ten grains,
Divide in five pills.

Dose: one, which may be repeated at the end of two hours if sleep be not procured.

Pills of Camphor.

Take of camphor, half a drachm,
Gum and alcohol, sufficient quantity to make pills.

Divide into fifteen. Dose: a pill every two hours. To quiet *nervousness*, and to act gently on the skin.

Opium Pill.

Take of powdered opium, twenty grains,
Castile soap, four scruples.

Beat together, and divide into five-grain pills. Useful when an opiate is required. Each pill contains one grain of opium.

ANTISPASMODICS.

These are medicines that counteract irregular or involuntary muscular action, which is known as spasm. This deranged state of the system depends on so many different causes, and is produced by so many different sources of irritation, that its successful treatment will very frequently depend on the employment of remedies calculated to remove the more remote cause or source of irritation by which the spasmodic affection is produced. It hence follows that, under peculiar circumstances, the remedies which will be found most successful in counteracting spasm must be derived from very distinct divisions of the Materia Medica; and thus the term antispasmodic may become applicable to a narcotic, a sedative, a stimulant, a cathartic, a tonic, and several other kinds of medicines. There are, however, certain substances which exercise a direct control over spasmodic action, independent of any influence upon its exciting causes, and these are meant when antispasmodics are spoken of.

MIXTURES, DRAUGHTS, &c.

Mixture of Valerian, Æther, &c.

Take of aniseed water, two ounces,
Ammoniated tincture of valerian, thirty drops,
Spirit of sulphuric æther, one drachm.

Mix. Take one half of this for a dose, and repeat it two or three times a day. In *hysterics*, *epilepsy*, &c.

Draught of Valerian, Castor, &c.

Take of infusion of valerian, eleven drachms,
Fœtid spirit of ammonia, half a drachm,
Tincture of castor, half a drachm.

Mix, and take all at a draught, two or three times a day, a short time before an anticipated attack of *epilepsy*.

Tincture of Wood-Soot.

Take of pure wood-soot, two ounces,
Assafœtida, one ounce,
Proof spirit, thirty-two ounces.

Let it stand for three days, and strain. Dose: one teaspoonful, three or four times a day. For children it must be proportionally reduced.

Mixture of Hoffman's Anodyne, &c.

Take of Hoffman's anodyne, three drachms,
Tincture of opium, one and a half drachms,
Cinnamon water, six ounces.

Mix. Dose: tablespoonful every one or two hours. In *hysterics*, or *cramp* in the *stomach*.

Mixture of Assafœtida, &c.

Take of assafœtida, one drachm,
Peppermint water, three ounces.

Dissolve; and add

Ammoniated tincture of valerian, two drachms,
Tincture of castor, three drachms,
Sulphuric æther, one drachm.

Mix. Dose: a tablespoonful (with plenty of water) every second hour. In *hysterics*.

PILLS.

Pills of Assafœtida, &c.

Take of assafœtida, one drachm,
Soap, ten grains,
Water, sufficient, and make twenty pills.

Dose: one or two, three times a day. To relieve *hysterical* symptoms.

TONICS.

Tonics constitute a class of medicines, the continued administration of which, in debilitated and relaxed conditions of the body, imparts strength and a more vigorous feeling, without producing, as stimulants do, any sudden excitement. To a certain extent tonics are stimulants, inasmuch as they arouse the vital energies; but the excitement has more the character of health, and is permanent. If, however, they are given when the system is unimpaired by disease, their primary action, like that of stimulants, is followed by prostration.

There is no class of remedial agents that requires more discrimination in its administration than tonics; nor any, the injudicious use of which more frequently produces evil consequences. The diseases in which this class of substances should be principally employed are evidently those of diminished power. But diminished power is often the consequence or concomitant of irritation or inflammation of the organs of digestion, and under such circumstances tonics will rather aggravate than mitigate the affection. To be used with effect, this condition must first be removed by such means as are pointed out in other parts of this work. Independent of their tonic properties, some of the medicines of this class possess the power of arresting those diseases that are distinguished by regular paroxysms. Peruvian bark is an example of this kind of remedies, and from its universal application to fever and ague, is called a *febrifuge*, or a medicine that checks fever. It cannot, however, be imagined that either this, or the other remedies having the same specific power over periodical fever, are *directly* antagonistic to its phenomena, for they are equally efficacious in other periodical diseases, in which febrile excitement may be altogether absent. This subject of antiperiodic remedies is one of great interest, and is involved in much obscurity; but as this is not the place for its investigation, we can do no more than merely refer to it, as has been done, and pass it by. Some of our best tonics are not drugs, but rather methods of treatment; such as *travelling*, *sea and shower bathing*, *general electrization*, *movement cure*, *&c.*

TONICS.

Mixture of Pyrophosphate of Iron.

Used as a tonic in nervous diseases.

Pyrophosphate of iron, one drachm,
Syrup, two ounces,
Cinnamon water, two ounces.

Dose: a tablespoonful *after* each meal.

Preparations of Iron, Quinine, and Strychnine.

Used as tonics in nervous diseases.

Wyeth's elixir and Caswell's preparation are now much used. The advantage of these preparations is, that they are carefully made, and are less offensive to the taste than many others.

Caswell, Hazard & Co.'s Ferro-phosphated Elixir of Calisaya Bark.

This preparation, which is now much used, contains three of our best tonics—*iron*, *phosphorus*, and *calisaya*.

In one pint of the elixir there are represented the following substances:—

Fluid extract of cinchona-calisaya, one ounce,
" " true cinnamon, two drachms,
" " caraway seed, one drachm,
" " sweet orange, one drachm,
Pyrophosphate of iron, sixty grains,
Simple syrup, three ounces,
Best brandy, four ounces,
Whiskey, three ounces,
Pure spirits and water, four ounces.

It will be seen that this formula contains a large number of our principal tonics. The preparation is more palatable than any combination of the same substances that would be made from an ordinary prescription. I do not think, however, that it is any more efficacious than other similar preparations. I recommend it because it is reliable, convenient, and comparatively agreeable to the taste.

For the same reason I frequently recommend *Wyeth's elixir of quinine, pyrophosphate of iron, and strychnine.*

Patients who are under medical treatment should, in all cases, take the prescriptions that are given them; but inasmuch as the ingredients of these tonic preparations are *not kept secret*, as with patent and quack medicines, and as their doses are fully established, physicians who reside in districts where they can be obtained frequently recommend them.

Each tablespoonful of the tonic preparation of Caswell, Hazard & Co. contains—

Sulphate of quinine,	¼ of a grain,
Cinchonine,	¾ " "
Alkaloids of bark,	¼ " "
Pyrophosphate of iron,	4 grains.

One grain of strychnine is sometimes added to a pint bottle of the ferro-phosphated elixir of calisaya bark.

Among the tonic prescriptions which in cases of necessity may be prepared and used at home are these:

Used in anæmia and nervous exhaustion.

Mixture of sulphuric acid, four drachms,
Syrup of orange peel, two ounces,
Cinnamon water, one ounce.

Mix, and take a teaspoonful three times a day, in a wine-glassful of water.

Mixture of Cinchona-Valerian.

Used in nervousness and debility.

Tincture cinchonæ, one ounce and a half,
Tincture valerian, one ounce,
Peppermint water, four ounces.

Mix, and take a tablespoonful three or four times a day.

Sulphate of Quinine in Syrup.

Used in ague.

Sulphate of quinine, sixteen grains,
Syrup of ginger, two ounces.

Mix, and take from one to four teaspoonfuls before the attack comes on.

Mixture of Arsenic and Iron.

Fowler's solution, one drachm,
Elixir of bark, three ounces,
Citrate of iron, two drachms.

Mix, and take two teaspoonfuls after each meal.

Elixir of Pepsin.

Used for dyspepsia.

Pepsin, one drachm and a half,
Water, six drachms and a half,
Sherry wine, twelve drachms and a half,
Alcohol, three drachms,
Sugar, one ounce.

Dissolve and strain. Take a tablespoonful, containing fifteen grains of pepsin, after each meal.

Syrup of the Hypophosphites of Lime, Soda, and Potash.

This preparation is now frequently recommended as a tonic in consumption and general debility. Though it does not do all that is expected of it, it is yet oftentimes of great service.

The formula for it as is follows:

Hypophosphite of lime, six drachms,
" soda, two drachms,
" potash, two drachms,
Hot water, ten ounces.

Dissolve, strain, and add

Sugar, fourteen ounces.

Dissolve, strain, and add

Water of orange flowers, half an ounce.

Mix, and take a teaspoonful three or four times a day.

The formula for this preparation is given so that those who take it may know what they are taking. It is not necessary to prepare this at home.

Emulsion of Phosphorus.

Phosphorus, two grains,
Mucilage, one ounce.

Mix thoroughly, and add gradually

Water, one ounce.

Make an emulsion, and add

Hoffman's Anodyne, thirty drops,
Syrup, one ounce.

Make a mixture. Dose: from one to four teaspoonfuls three times a day. I do not recommend *phosphorus* in this form as a *domestic* remedy. The best way to get the tonic effects of phosphorus is to take pyrophosphate of iron in the preparations above described, or in the form of *diluted phosphoric acid*, in doses of from *ten to thirty drops in sweetened water.*

MIXTURES, DECOCTIONS, &c.

Mixture of Sulphate of Quinine, &c.

Take of sulphate of quinine, twenty grains,
Diluted sulphuric acid, twenty-five drops,
Orange syrup, one ounce,
Water, five ounces.

Mix. Take a tablespoonful four times a day. To be taken during the intermission in fever and ague. In some cases the dose may be doubled with advantage. It may also be used as a tonic in convalescence after a fever.

Decoction of Dog-wood Bark.

Take of dog-wood bark, bruised, one ounce,
Water, one pint.

Boil for ten minutes and strain while hot. Dose: two ounces, frequently repeated. Substitute for Peruvian bark in *fever and ague*, and as a general tonic. It answers a very good purpose, and in parts of the country where no other remedy can be obtained, may be resorted to with every hope of success.

Decoction of Willow Bark.

Take of willow bark, one ounce,
Water, one pint.

Boil for ten minutes, and strain. Dose: four tablespoonfuls four or five times a day. This is another substitute for Peruvian bark in *fever and ague*, and is thought by many to be very little inferior to it.

Infusion of Virginia Snake-Root.

Take of Virginia snake-root, one ounce,
Boiling water, one pint.

Infuse for a few hours, and strain. Dose: one or two tablespoonfuls four times a day in *low forms of fever;* in chronic diseases the quantity may be less. If given for fever and ague, for which it is strongly recommended, the dose may be increased. It is also successfully employed in promoting the monthly discharge of females; in this case it must be used all the time during the intervals.

Infusion of Boneset or Thoroughwort.

Take of the boneset leaves, dried, one ounce,
Boiling water, one pint.

Let it stand for two hours, and then strain. This is another medicine that has been employed as a substitute for Peruvian bark in the treatment of fever and ague. It is not equal to it, but will often cure. In all cases of debility, when a tonic is required, it may be used; and if there be also some fever, perhaps no better can be employed. Dose: for *ague*, as much as the stomach will bear, and should be drunk *warm.*

Compound Infusion of Gentian.

Take of bruised gentian, half an ounce,
Dried orange peel, one drachm,
Coriander, bruised, one drachm,
Alcohol, diluted, four fluid ounces,
Water, cold, twelve ounces.

Let it stand for twelve hours, and strain. Dose: two tablespoonfuls, three times a day. This is an excellent tonic, and may be used in all cases of debility of the *digestive organs*, if there be no irritation or inflammation of the stomach. It is very good to correct the acid secretions.

Infusion of Colomba, Ginger, &c.

Take of colomba, bruised, half an ounce,
Ginger, bruised, half an ounce,
Senna, two drachms,
Boiling water, one pint.

Let it stand for an hour, and strain. Dose: a wine-glassful three times a day. An excellent remedy in *dyspepsia* with constipation and flatulence.

Infusion of Wild-Cherry Bark.

Take of wild-cherry bark, one ounce,
Orange peel, two drachms,
Water, one pint.

Infuse the bark for an hour and then add the orange peel. Dose: a wine-glassful every hour or two. It is highly useful in the *hectic fever* of scrofula and consumption. In the general debility often succeeding inflammatory diseases it has been found advantageous, and is adapted to many cases of *dyspepsia.*

Mixture of Peruvian Bark, in Wine.

Take of powdered bark, half an ounce,
Lemon-juice, two drachms,
Port wine, four ounces.

Mix. Dose: a wine-glassful every two hours, during the intermission of *fever.*

Huxham's Tincture of Bark.

Take of Peruvian bark, in powder, two ounces,
Orange peel, one and a half ounce,
Virginia snake-root, bruised, three drachms,
Saffron and red saunders, rasped, each one drachm,
Alcohol, diluted, twenty ounces.

Let it stand for fourteen days, and filter through paper. Dose: from one to four teaspoonfuls. This is an excellent *stomachic cordial.* If a grain or two of quinine be added to each dose, it is a very excellent remedy for *fever and ague,* and will often succeed when the other preparations of bark have failed.

Mixture of Green Vitriol, &c.

Take of green vitriol, four grains,
Aromatic sulphuric acid, twenty drops,
Syrup, half an ounce,
Water, one ounce.

Mix. Dose: a teaspoonful to be taken three times a day in a wine-glass of water. A very good tonic when there are no inflammatory symptoms present. None of the preparations of iron should be administered when the patient is plethoric or inclined to fever. Good in *chlorosis* or *green-sickness,* and for restoring *monthly sickness.*

Tincture of Iron.

Take of tincture of muriate of iron, one ounce.

Dose: ten to twenty drops three times a day, in a wine-glass of water. Used as the preceding prescription. It is also astringent, and is employed to check *passive hemorrhages.*

PILLS.

Pills of Oxide of Zinc.

Take of oxide of zinc, two scruples,
Confection of roses, sufficient quantity.

Make ten pills. Dose: one, three times a day. This is often employed with success in *St. Vitus's dance*, *epilepsy*, and other similar nervous affections.

Pills of Iron and Aloes.

Take of sulphate of iron, three parts,
Aloes, two parts,
Aromatic powder, six parts,
Conserve of roses, eight parts.

Mix. Divide into five-grain pills. Dose: one to three. This is a good pill in *green-sickness* and *interrupted menstruation.*

Pills of Rhubarb and Iron.

Take of sulphate of iron, four parts,
Extract of rhubarb, ten parts,
Conserve of roses, five parts.

Mix. Divide into five-grain pills. Dose: two to four. A *stomachic.*

Pills of Oxide of Bismuth.

Take of oxide of bismuth, two scruples,
Gum arabic and water, sufficient quantity.

Make a mass and divide into thirty pills. Two for a dose, four times a day. A very good remedy in *dyspepsia*, when there is much *pain* in the stomach.

ALTERATIVES.

These are "medicines that re-establish the healthy functions of the animal economy without producing any active evacuation."

Their effects are *slow*, but positive, and oftentimes exceedingly beneficial. In order to get the alterative effect of any medicine it is generally necessary to give it in *small* doses, frequently repeated for a long time. *Calomel*, *arsenic*, *cod-liver oil*, are classed among the alteratives, although calomel in large doses is a cathartic, and arsenic and cod-liver oil are tonics. *Iodine* is the most prominent of the alteratives.

Mixture of Iodide of Potassium.

Used in syphilis.

Iodide of potassium, one drachm,
Syrup of ginger, one ounce,
Water, five ounces.

Take a tablespoonful three times a day.

Mixture of Iodide of Potassium and Sarsaparilla

Used in syphilis.

Iodide of potassium, two scruples,
Water, three ounces,
Sugar, one ounce,
Fluid extract of sarsaparilla, half an ounce.

Dose: one tablespoonful three times a day.

ASTRINGENTS.

This is a class of medicines which, when applied to a sensible or visible part of the body, is found to produce a contraction or condensation. It is impossible to explain why such results take place, but it is probable that they are generally chemical phenomena. The consequence of their action is a diminished secretion; and most if not all of them act, finally, as tonics.

It is for their property of constringing the tissues that they are arranged under this head, regardless of any other qualities they may possess. Astringents have the power not only of checking secretions of the part with which they are directly in contact, but also that of parts more or less remote.

Remedies of this class cannot safely be resorted to in every case in which a discharge is too great. It is only when diseases are of long standing and have become chronic, or when there is no accompanying constitutional excitement, that they can properly be employed. They otherwise may be expected to cause general reaction, and induce a train of symptoms more aggravated than those which existed in the first instance.

There are certain other medicines, though not belonging to the class of astringents, that are equally powerful in arresting internal secretions. They do this by establishing a new train of actions incompatible with the secreting functions. Some of the narcotics have this property. Opium furnishes a striking example of such substances. Ipecacuanha, acting by a different process, will also cause a similar general result.

MIXTURES, DECOCTIONS, &c.

Chalk Mixture, &c.

Take cinnamon water, one ounce,
Chalk mixture, half an ounce,
Tincture of kino, two drachms,
Laudanum, eight drops,
Orange syrup, two drachms.

Mix. Dose: one to two teaspoonfuls, in the *purging of children*, when there is no fever. This is a very well-known and a very excellent mixture.

Draught of Cascarilla, &c.

Take of infusion of cascarilla, six drachms,
Cinnamon water, two drachms,
Compound powder of kino, ten grains,
Laudanum, eight drops.

Mix. Dose: all at once,—to be taken twice a day. In relaxation of the bowels after *dysentery*. For a young child, one-fourth of this quantity.

Infusion of Angustura Bark.

Take of angustura bark, bruised, half an ounce,
Boiling water, one pint.

Let it stand for two hours, and strain. Doses: two ounces, repeated every three hours. This has high recommendations as a remedy for *bilious diarrhœa* and *dysenteries*, especially of southern latitudes.

Decoction of Logwood.

Take of rasped logwood, one ounce,
Cinnamon, one drachm,
Water, two pints.

Boil down to a pint, and strain. Dose: two ounces repeated several times a day; for a child two years of age, two teaspoonfuls. This is an excellent astringent in *chronic diarrhœa* and *dysentery*, for which it is peculiarly suitable, as while it checks the discharge it does not produce the opposite condition—constipation. It has also been used in the sweating of *consumption*.

Decoction of Avens.

Take of avens root, bruised, one ounce,
Water, one pint.

Boil down one-third. Dose: one to two tablespoonfuls, several times a day. Useful in such cases and circumstances as the foregoing. It is perhaps one of the best domestic astringents we possess, and is much used in some parts of the country.

Infusion of Rhatany.

Take of rhatany, one ounce,
Boiling water, one pint.

Let it stand for four hours, and then strain. Dose: two to four tablespoonfuls. This is a powerful astringent and tonic, and is much employed in the treatment of *chronic diarrhœa* and *dysentery*, in *passive hemorrhages*, in *bleeding* from the *womb* and *kidneys*, and in *mucous discharges*, that seem kept up by debility of the part.

Decoction of Oak Bark.

Take of oak bark, one ounce,
Water, two pints.

Boil to one pint, and strain. Dose: one to four ounces. Used like the preceding. Very good, and always at hand. It is also a useful injection for *whites*, and is sometimes serviceable, employed in this way, in *falling of the womb*.

Decoction of Bearberry.

Take of bearberry, one ounce,
Water, one and a half pints.

Boil to one pint, and strain. Dose: one to three ounces every four hours. Chiefly used in mucous discharges of the *urinary organs*, as catarrh of the bladder, gleet, and in *whites*.

Hope's Mixture.

Take of camphor water, four ounces,
Nitric acid, four drops,
Laudanum, fifty drops.

Mix. Dose: a tablespoonful every two hours. In *diarrhœa* and *dysentery*. This mixture is somewhat celebrated, and is much employed by medical men.

PILLS.

Pills of Sugar of Lead and Opium.

Take of sugar of lead, powdered, one scruple,
Opium, ten grains,
Gum arabic and water, sufficient quantity.

Divide in ten pills. Dose: one pill every two hours. In bleeding from the *lungs* and other internal organs. These may be used even when there is considerable excitement of the pulse, as they have the effect of a sedative. It is well to remember that the *carbonate* of lead *may* produce the painter's colic. In taking this medicine, therefore, it is advisable to drink a little vinegar and water between the doses, to prevent any such serious consequences. The sugar of lead and opium is also an admirable remedy, reducing the quantity of opium one half, in *chronic diarrhœa* and *dysentery*; and it is recommended by some practitioners very highly in *Asiatic cholera*.

Pills of Tannin and Opium.

Take of tannin, thirty grains,
Powdered opium, six grains,
Gum arabic and water, sufficient quantity.

Divide into fifteen pills. Dose: one, every two or three hours In *chronic diarrhœa* and *dysentery.*

GARGLES.

Gargle of Borax.

Take of borax, one drachm,
Tincture of myrrh, half an ounce,
Pure honey, one ounce,
Water, four ounces.

Mix. Useful in *scorbutic affections* of the gums, and for cleansing the mouth.

Gargle of Sage Tea, Alum, and Honey.

Used for all kinds of sore throat.

Sage tea, one pint,
Alum, half an ounce,
Honey, one ounce.

Gargle of Chlorate of Potash.

Used for quinsy and other forms of sore throat.

Chlorate of potash, two drachms,
Tepid water, one pint.

Gargle of Brandy.

Brandy, two ounces,
Water, four ounces.

Gargle of Sage and Flax-seed.

Sage, two ounces,
Flax-seed, one ounce,
Boiling water, one pint.

Gargle of Alum.

Take of alum, powdered, two scruples,
Water, four ounces.

Mix. In *relaxation* of the *palate* and *bleeding gums.*

Gargle of Chloride of Soda.

Take chlorine water, half an ounce,
Syrup, one ounce,
Water, five ounces.

Mix. In *putrid sore throat* and *scarlet fever.* It is also highly useful in severe *salivation.* If it should be too stimulating, add a little more water to it.

Gargle of Muriatic Acid.

Take of muriatic acid, thirty drops,
Honey, two ounces,
Barley-water, six ounces.

Mix. In *inflammatory sore throat.*

Gargle of Oak Bark.

Take of oak bark, two drachms,
Water, boiling, six ounces.

Let it stand for an hour, and strain. Ten grains of alum added to it increases its astringency. In *relaxation* of the *palate.*

Gargle of Vinegar.

Take of barley water, five ounces,
Vinegar, pure, eight ounces,
Honey, six drachms.

Mix. For common *sore throat,* and as a wash to *cleanse* the mouth.

EYE-WASHES.

Wash of Sugar of Lead.

Take of sugar of lead, twenty grains,
Laudanum, forty drops,
Pure water, four ounces,
Vinegar, two drachms.

Dissolve. (See *Eye, Diseases of.*)

Wash of Alum.

Take of alum, powdered, fifteen grains,
Rose-water, four ounces.

Dissolve. For the eye in *chronic inflammation.*

INJECTIONS FOR THE URETHRA.

Injection of Carbolic Acid and Glycerine.

Used for gonorrhœa.

Carbolic acid, eight grains,
Glycerine, two ounces,
Water, two ounces.

Injection of Chlorate of Potash.

Used for gonorrhœa.

Chlorate of potash, half a drachm,
Water, five ounces.

Injection of Sulphate of Zinc.

Take of white vitriol, ten grains,
Powdered gum arabic, two drachms,
Laudanum, one drachm,
Water, eight ounces.

Used for an injection in *acute gonorrhœa.*

Injection of Sulphate of Copper.

Take of blue vitriol, six grains,
Pure water, six ounces.

Dissolve. Used for the same purpose as the preceding. Laudanum may be added to any of them if thought proper, and it is often of service.

The foregoing may all be employed as injections for *whites*, by increasing the quantities.

PLASTERS.

The following description of the method of preparing plasters I take from the United States Dispensatory:

"Plasters are solid compounds intended for external application, adhesive at the temperature of the human body, and of such a consistence as to render the aid of heat necessary in spreading them. Most of them have as their basis a compound of olive oil and litharge, constituting the *Emplastrum plumbi* of the United States Pharmacopœia.

"Plasters are prepared for use by spreading them upon leather, linen, or muslin, according to the particular purposes they are intended to answer. Leather is most convenient when the application is made to the sound skin; linen or muslin when the plaster is used as a dressing to ulcerated or abraded surfaces, or with the view of bringing and retaining together the sides of wounds. The leather usually preferred is white sheepskin.

"A margin about a quarter or half an inch broad should usually be left uncovered, in order to facilitate the removal of the plaster, and to prevent the clothing in contact with the edges from being soiled."

Plaster of Belladonna (*Emplastrum Belladonnæ*).

"Take of resin plaster, three ounces; extract of belladonna, an ounce and a half. Add the extract to the plaster, previously melted by the heat of a water-bath, and mix them."

Iron Plaster; Strengthening Plaster (Emplastrum Ferri).

"Take of subcarbonate of iron, three ounces; lead plaster, two pounds; Burgundy pitch, half a pound. Add the subcarbonate of iron to the lead plaster and Burgundy pitch, previously melted together, and stir constantly until they thicken upon cooling."

Galbanum Plaster (Emplastrum Galbani).

"Take of litharge plaster (*Emplastrum plumbi*), two pounds; galbanum, half a pound; yellow wax, sliced, four ounces. Add the litharge plaster and wax to the galbanum, previously melted; then melt the whole together with a moderate heat, and strain."

Opium Plaster (Emplastrum Opii).

"Take of opium, in powder, two ounces; Burgundy pitch, three ounces; lead plaster, a pound; boiling water, four fluid ounces. Melt together the lead plaster and Burgundy pitch, then add the opium, previously mixed with the water, and boil them over a gentle fire to the proper consistence."

Lead Plaster; Litharge Plaster (Emplastrum Plumbi; Emplastrum Lithargyri).

"Take of semi-vitrified oxide of lead, in very fine powder, five pounds; olive oil, a gallon; water, two pints. Boil them together over a gentle fire, stirring constantly, until the oil and oxide of lead unite into a plaster. It will be proper to add a little boiling water, if that employed at the commencement be nearly all consumed before the end of the process."

Adhesive Plaster (Emplastrum Resinæ).

"Take of resin, in powder, half a pound; lead plaster, three pounds. To the lead plaster, melted over a gentle fire, add the resin, and mix them."

Soap Plaster (Emplastrum Saponis).

"Take of soap, sliced, half a pound; lead plaster, three pounds. Mix the soap with the melted plaster, and boil for a short time."

OINTMENTS.

These are made by mixing lard with some medicated substance.

Glycerine Ointment.

Used for chapped hands, abrasions of the skin, and sore lips.

White wax, half a drachm,
Oil of almonds, two ounces.

Mix by heating, and then add,

Of glycerine, one ounce.

Ointment of Iodine and Collodion.

Used for tumors, swellings, &c.

Iodine, one drachm,
Turpentine, one drachm,
Collodion, four ounces.

Apply with a brush.

Ointment of Iodide of Sulphur.

Used for itch, eczema, and other diseases of the skin.

Iodide of sulphur, twenty-five grains,
Lard, one ounce.

Ointment of Iodide of Arsenic.

Used for itch, and other diseases of the skin.

Iodide of arsenic, three grains,
Lard, one ounce.

Ointment of Carbolic Acid.

Used in diseases of the skin.

Carbolic acid, five grains,
Lard, one ounce.

Ointment of Bromide of Potassium.

Used for tumors.

Bromide of potassium, thirty grains,
Lard, one ounce.

Ointment of Veratria.

Used for neuralgia.

Veratria, ten grains,
Acetic acid, ten drops.
Lard, one ounce.

Ointment of Galls, &c.

Take of powdered galls, one ounce,
Camphor, half a drachm,
Laudanum, two drachms,
Spermaceti, or lard, one ounce.

Make an ointment. An astringent ointment for *piles*, after the inflammatory stage has passed away.

Ointment of Tar, &c.

Take of tar, one ounce,
Powdered opium, two drachms.

Make an ointment. For *piles*. It may also be used for *scald-head*.

Ointment of Sugar of Lead.

Take of sugar of lead, in very fine powder, one part,
Simple ointment, twenty parts.

Mix them thoroughly. This is an excellent ointment in *burns*, *blisters* in *an inflamed state*, and other *excoriated* or *ulcerated* surfaces.

Simple Ointment.

Take of lard, one pound,
White wax, four ounces.

Melt together and stir till cold. Useful as a common dressing to *sores* and *inflamed surfaces*.

Ointment of Oxide of Zinc.

Take of oxide of zinc, one ounce,
Lard, six ounces.

Mix. A drying ointment; used in *burns*, *blisters*, *excoriations*, various *skin diseases*, and in chronic inflammation of the *eyelids*.

Ointment of Pitch and Sulphur.

Take of tar, half a pound,
Wax, half an ounce,
Flowers of sulphur, two ounces.

Mix. Used in *itch*, *tetter*, and *scaly* diseases of the skin, *ringworm*, *&c.*

Ointment for Piles.

Take of carbonate of lead, four drachms,
Sulphate of morphia, fifteen grains,
Stramonium ointment, one ounce,
Olive oil, sufficient quantity.

Mix. To allay *pain* and *inflammation*.

Ointment of Stavesacre.

Take of powdered stavesacre, one ounce,
Lard, three ounces.

Melt together, let it stand for three hours, and strain. In *itch*, and to destroy *vermin* on the body.

Ointment of Thorn Apple.

Take of thorn-apple leaves, fresh, two ounces,
Lard, five ounces.

Boil until the leaves become crisp, and then strain through linen Melt an ounce of wax, and mix all together while they are in a fluid state. If the fresh leaves cannot be obtained, an ounce of dry powdered leaves may be substituted for them. Useful to dress *irritable ulcers*, and as an application to *painful piles*.

Ointment of Iodine.

Take of iodine, half a drachm,
Iodide of potassium, one drachm,
Rectified spirit (alcohol), one drachm.

Rub together, and add two ounces of lard. Used in *enlarged glands*, *scrofulous sores*, *&c.*

Itch Ointment.

Take flowers of sulphur, two ounces,
Sulphate of zinc, two drachms,
Powdered hellebore, four drachms,
Soft soap, four ounces,
Lard, eight ounces. Mix.

Cerate of Savin.

Take of savin, in powder, half an ounce,
Resin cerate, four ounces.

Soften the cerate with heat, and mix the powder with it. This is much employed for dressing *blistered* surfaces to prevent them from healing.

Resin Cerate.

Take of resin, four ounces,
Yellow wax, two ounces,
Lard, eight ounces.

Melt. Useful to bring deep inflammations to a *head*, as *boils*, &c.

LINIMENTS AND LOTIONS.

Liniment for Burns.

Take of olive or linseed oil, and lime-water, equal parts. Mix, and agitate well. For severe *burns*.

Lotion of Carron Oil and Carbolic Acid.

Used for burns.

Liquid carbolic acid, one drachm,
Linseed oil, three ounces,
Lime-water, three ounces.

Lotion of Permanganate of Potash.

Used for burns, ulcers, and as a disinfectant.

Permanganate of potash, half a drachm,
Water, one pint.

Lotion of Creosote.

Used for diseases of the skin and ulcers.

Creosote, ten drops,
Olive oil. one ounce.

Compound Chloroform Liniment.

Used for neuralgia and rheumatic pains.

Chloroform, one ounce,
Æther, one ounce,
Spirit of camphor, one ounce,
Laudanum, one ounce,
Tincture of cayenne pepper, half an ounce

Lotion of Glycerine and Borax.

Used for sore nipples, chapped lips and hands.

Borax, half a drachm,
Rose-water, eight ounces,
Glycerine, half an ounce.

Glycerine Cream.

Used for chapped hands, chilblains, &c.

Glycerine, one ounce,
Soft soap, one ounce,
Laurel water, one ounce.

Lotion of Sulphite of Soda.

Used for *pimples* and other diseases of the skin.

Sulphite of soda, one drachm,
Sulphate of alum, one drachm,
Rose-water, eight ounces.

Lotion of Tannin and Glycerine.

Tannic acid, fifteen grains,
Glycerine, one ounce.

Lotion of Carbolic Acid.

Used for burns and ulcers.

Carbolic acid, five grains,
Water, one ounce.

Liniment of Petroleum, Camphor, &c.

Petroleum, one ounce,
Camphor, half an ounce,
Alcohol, half a drachm.

Soap Liniment.

Take of castile soap, four ounces,
Oil of rosemary, five drachms,
Camphor, two ounces,
Alcohol, one and a half pint.

Mix and dissolve. This is used in *rheumatism*, *swellings*, *bruises*, *sprains*, *local pains*, &c.

Opium Liniment.

Take of soap liniment, six ounces,
Laudanum, two ounces.

Mix. An excellent anodyne in *rheumatism*, *neuralgia*, *sprains*, &c.

FOMENTATIONS.

When fluids are applied to any special portion of the body by means of a cloth or flannel, the process is called a fomentation.

Anodyne Fomentation.

Extract of opium, one ounce,
Water, one pint.

This is used for neuralgia and rheumatism.

Fomentation of Soap.

Used for sprains.

Soap, one ounce,
Alcohol, two pints.

MEDICATED BATHS.

Emollient Bath.

For eczema, prurigo, and some other diseases of the skin.

Glycerine, one ounce,
Powder of tragacanth, one ounce,
Tepid water, fifteen gallons.

Nitro-Muriatic Bath.

For diseases of the liver.

Nitric acid, two ounces,
Muriatic acid, three ounces,
Water, ten gallons and a half.

Alkaline Bath.

For itching, and diseases of the skin.

Impure carbonate of potash, eight ounces,
Tepid water, thirty gallons.

POULTICES.

Mustard Poultice.

Take of powdered mustard, two ounces,
Vinegar, as much as necessary to make a poultice.

This may be too strong for young children or persons having very thin skins. In such case, from one-third to one-half of flour or Indian meal may be added, and instead of vinegar, water may be employed. It is seldom that it can be borne longer than half an hour.

Poultice of Flax-seed.

Take of ground flax-seed, one part,
Barley meal, one part,
Water, enough to make a poultice.

Used for *painful inflammations* of all kinds.

Yeast Poultice.

Take of flour, one pound,
Yeast, half a pint.

Mix. To be applied warm to *foul-smelling* and *gangrenous* sores.

Charcoal Poultice.

Take bread and milk poultice, and stir into it as much fine powdered charcoal as it will allow. Used to old and *foul ulcers* that have a *fœtid* smell, and to *gangrenous sores.*

Slippery-elm Poultice.

Take any quantity of slippery elm, and moisten it with hot water. This is a poultice that is excellent for *irritable sores*, when a soothing effect is desired.

If a more sedative effect be wished, half an ounce of *laudanum* may be added to either the bread, flax-seed, or slippery-elm poultice.

It may be added, that poultices should never be made unneces sarily heavy nor thick, and they should be frequently repeated. They always ought to be put on warm, and as moist as they can be made without being so soft as to flow when placed upon the skin. When they become dry, and the temperature falls, they can do but little if any good, and may possibly cause more injury than service. The common poultices are useful in all cases of inflammation that cannot be cut short, to assist the process of suppuration, and the tendency of matter to the surface.

MISCELLANEOUS RECIPES.

DRINKS, BEVERAGES, &c.

Aniseed Cordial.

Take of bruised aniseeds, one pound,
Proof spirit, six gallons,
Water, half a gallon.

Put it into a still, and draw off by distillation five gallons with a moderate fire.

Caraway Cordial.

Take oil of caraway, six drachms,
Sugar, four pounds,
Oil of cinnamon, ten drops,
Oils of orange and lemon, of each two drops,
Alcohol, six gallons,
Water, two gallons.

Fine with alum.

Cinnamon Cordial.

Take of oil of cinnamon, thirty drops,
Sugar, refined, three pounds,
Alcohol, fifteen ounces,
Orange and lemon, of each half an ounce,
Cardamom seeds, half an ounce,
Water, one gallon.

Fine with alum, and if it is wished colored, add burnt sugar.

Citron Cordial.

Take of essence of lemons, half an ounce,
Essence of oranges, half an ounce,
Refined sugar, four pounds.

Beat all up together, add

Dried lemon and orange peel, of each four ounces.

Infuse all in six gallons of alcohol that has stood upon seven pounds of figs for a week. If required, water may be added.

The cordials may be made either by distillation, as in the first recipe; or they may be made by dissolving the oils, as in the last. Distillation is preferable, but it is not always convenient.

Ginger Beer.

White sugar, twenty pounds,
Lemon-juice, eighteen ounces,
Honey, one pound,
Bruised ginger, seventeen ounces,
Water, eighteen gallons.

Boil the ginger in three gallons of the water for half an hour; then add the sugar, the juice, and the honey, with the remainder of the water, and strain through a cloth. When cold, add the white of an egg, and half an ounce of the essence of lemon; after standing four days, bottle. This affords a very superior beverage, and one that will keep for many months. A very refreshing drink in warm weather.

Lemon Syrup.

Take oil of lemon, six drachms,
Refined sugar, twelve pounds,
Water, one gallon.

Boil the sugar and water over a moderate fire, and remove the scum. While hot, stir in the oil and a quarter of an ounce of tartaric acid. When cold, bottle and cork. This is the lemon syrup that is in common use at the shops and among the confectioners.

PERFUMERY, &c.

Cologne Water.

Take of alcohol, one gallon,
Oil of bergamot, one ounce,
Oil of rosemary, one ounce,
Oil of lemon, two drachms,
Oil of lavender, four drachms,
Oil of cassia and cloves, of each five drops,
Ottar of roses, twenty drops. Mix and filter.

There are many formulæ for making this water, and the ingredients may be varied to suit individual tastes. It should be known that it is essential that the spirit be of the purest kind, ***scentless*** and *tasteless*, and that the oils be genuine and *fresh*.

Lavender Water.

Take oil of lavender, eight ounces,
Essence of bergamot, one and a half ounce,
Essence of musk, four ounces,
Alcohol, two gallons.

Mix well. This is very fine.

Rose-Water.

Take ottar of roses, twenty-five drops.

Rub it in with an ounce of white sugar and four drachms of carbonate of magnesia; then add, gradually, half a gallon of water and four ounces of proof spirit.

Stimulant for the Hair.

Take of spirits of hartshorn, two ounces,
Lard oil, twelve ounces.

Shake well together, and take care that it is kept tightly bottled.

Powder to Remove Hair.

Take of fresh lime, one ounce,
Pure potash, one drachm,
Sulphuret of potash, one drachm.

Reduce them to a fine powder in a mortar. If the hair be first soaked or washed in warm water for ten minutes, this article, formed into a thin paste with warm water, and applied while warm, will so thoroughly destroy the hair in five or six minutes, that it may be removed by washing the skin with a rough cloth. It is a powerful caustic, and should therefore be removed as soon as it begins to inflame the skin, by washing it off with vinegar. It softens the skin and greatly improves its appearance.

Pearl Powder.

Take of fine starch, well sifted, four ounces,
White oxide of bismuth, one ounce.

Mix well together. For the skin.

Lip Salve.

Take of white wax, one ounce,
Sweet oil, one ounce,
Spermaceti, one drachm.

Melt all together, adding a little alkanet root to color, and while cooling add oil of roses to perfume.

White Liniment for Chapped Hands, &c.

Take of oil of turpentine, two ounces,
Soap liniment, three ounces,
Distilled vinegar, eight ounces,
Ammonia water, two ounces,
Spirit of rosemary, one ounce.

The ingredients to be mixed in the above order.

Cold Cream.

Take of oil of almonds, two ounces,
Spermaceti, half an ounce,
White wax, one drachm.

Melt together, and while cooling add two ounces of rose-water, stirring it until cold..

Milk of Roses.

Take of sweet almonds, half a pound,
Rose-water, four pints.
White wax and white soap, of each six drachms,
Oil of almonds, six drachms,
Alcohol, twelve ounces.

Mix. Add oil of lavender, oil of roses, &c., to please the fancy

Hair Oil.

Take of olive oil, sixteen ounces,
Cognac brandy, sixteen ounces,
Oil of bergamot, half an ounce,
Ottar of roses, ten drops.

Mix.

Macassar Oil.

Take of olive oil, one pound,
Oil of origanum, one ounce,
Oil of rosemary, one scruple.

Mix.

Tooth Powder.

Take of prepared chalk, two ounces,
Myrrh, one drachm,
Powdered Peruvian bark, half an ounce,
White sugar, one ounce,
Rose pink, one ounce.

Mix.

Or,

Take of prepared chalk, four ounces,
Powdered alum, two drachms,
Cream of tartar, two ounces,
White sugar, one ounce,
Powdered orris-root, one and a half ounce.

Mix. This is a very good dentifrice.

Fumigating Pastils.

Take powdered gum benzoin, sixteen parts,
Balsam of Peru, four parts,
Powdered sandal-wood, four parts,
Light charcoal, forty-eight parts,
Powdered tragacanth, one part,
Powdered nitre, two parts,
Gum arabic, two parts,
Cinnamon water, twelve parts.

Heat to a smooth ductile mass, form into small cones with a flat base, and dry in the air.

LOZENGES.

Bismuth Lozenges.

Take of white oxide of bismuth, two drachms,
White sugar, two and a half ounces,
Mucilage of tragacanth.

Mix, and proceed as in the first recipe. Divide into one hundred and twenty lozenges. Tonic and antispasmodic. One to three may be sucked two or three times a day, in *dyspepsia* accompanied with pain in the stomach.

Ginger Lozenges.

Take of finely powdered Jamaica ginger, one ounce,
White sugar, one pound,
Mucilage of tragacanth, to mix.

Prepare as in the first one, and divide into fifteen-grain lozenges. Useful in *flatulency* and *dyspepsia.* A good stomachic.

Lozenges of Nitre.

Take of nitre, three ounces,
White sugar, nine ounces,
Mucilage of tragacanth, to mix.

Proceed as in the others to prepare the mass. Divide into lozenges of twelve grains each, and take one every two hours. A *diuretic.* It is a good remedy for *inflammation* of the *mouth* and *throat.*

Rhubarb Lozenges.

Take of powdered rhubarb, one ounce,
Sugar, eleven ounces.

Mucilage, to mix, and prepare in the same way as the preceding ones. Divide into lozenges of twelve grains each. *Stomachic* and *laxative.* For those who are habitually constipated, this is a very neat and agreeable way of taking medicine for relief.

All other medicines in powder may be administered in the shape of lozenges, and unless their taste is so strong and nauseous that it cannot be disguised, it is often a very agreeable way of taking them.

For Corns.

Take sal ammoniac, one ounce,
Spirit, four ounces.

Dissolve. Moisten the corn with this lotion morning and evening.

Or,

Take of white diachylon, two ounces,
Yellow rosin, two ounces.

Melt, and add finely powdered verdigris, one ounce. Spread it on paper, linen, or leather, and apply a small piece to the corn.

Chilblain Lotion.

Take alum, two drachms,
Distilled vinegar, half a pint,
Alcohol, half a pint.

Dissolve, and use as a lotion.

Chilblain Ointment.

Take of lard, nine ounces,
Oil of almonds, three and a half ounces,
White wax, one and a half ounce,
Camphor, powdered, one and a half ounce.

Mix, and apply to the chilblain.

LIST OF MEDICINES,

THEIR

PREPARATIONS AND DOSES.

The doses here prescribed are for adults. The rules for graduating the doses according to the age of children are found on page 460.

This list includes not only the recent and common preparations, such as have already been described, but also a large number of simple and popular remedies, which have not yet been mentioned in the book.

TINCTURES.

THESE are made by bruising or grinding the substance used to a powder, letting it stand from seven to fourteen days, and then filtering through paper. The average proportion is about an ounce of the substance to a pint of alcohol. This proportion is more or less modified by the strength of the substance used.

INFUSIONS.

These are made by pouring *boiling* water on vegetable remedies, and allowing it to stand until it cools. The average proportion is about an ounce of the substance to a pint of boiling water.

PILLS.

Pills are made by *accurately weighing* the substances to be used and then mixing them with water, alcohol, syrup, or bread, or mucilage, or soap, or molasses, or any other mild substance that will bring them to a proper consistence. Powders are usually mixed with *syrup* or *mucilage*, resins with *alcohol*, liquid remedies with *starch* or *bread*.

The mass, after it has been thoroughly mixed with a knife or spatula, should be rolled into a cylinder, and then cut off into equal portions, each portion containing the dose of the medicine required. Each pill is to be rolled into a round shape between the thumb and fingers.

Only sea-captains, and others who are similarly situated in regard to medical advice and druggists' shops, will ordinarily find it necessary to make pills.

ACID ACETIC, diluted (*Vinegar*).—It is a refrigerant and diuretic. It is sometimes administered in those affections of the urinary organs in which there is a white deposit in the urine, caused by phosphatic salts. Employed as a lotion, externally, in bruises and sprains. Dose: one to four teaspoonfuls in a little water.

Acid Benzoic.—Prepared from benzoin. Used in gravel. Dose: from five to thirty-five grains.

Acid Carbolic.—Disinfectant in various strengths. Used in skin diseases and inflammations of mucous membranes. (See *Inhalations*, *Catarrh*, and *Ointments.*)

Acid Chromic.—Used as a caustic.

Acid Citric.—Refrigerant or cooling, like lemon-juice. To prepare a solution of the strength of lemon-juice, eight and a half drachms are to be dissolved in sixteen ounces of water. It is employed to form effervescing draughts. Dose: a tablespoonful of lemon-juice, or an equivalent solution of citric acid.

Acid Muriatic, diluted, or *Hydrochloric Acid.*—A refrigerant, and preventive of putrescency. Employed in low fevers, malignant scarlet fever, when there is gangrenous ulceration of the throat, in debility of the digestive organs, when there is a tendency to produce worms, &c. Dose: twenty to forty drops, largely diluted with water, or an infusion of quassia.

Acid Nitric, diluted.—A tonic. Used internally, principally in chronic inflammation of the liver, and secondary syphilis. Dose: ten to thirty drops, administered in the same form as muriatic acid.

Acid Nitro-Muriatic, diluted.—Employed in chronic diseases of the liver, chronic cutaneous diseases, and in debilitated and syphilitic constitutions. It may cause salivation. Dose: ten to thirty drops, largely diluted.

Acid Phosphoric.—A tonic. Used in nervous diseases. Dose: from five to twenty drops in sweetened water.

Acid Sulphuric, diluted.—It is a tonic, refrigerant, and astringent. Used in low fevers, in internal bleedings, and in the excessive sweating of consumption. Dose: ten drops to thirty, in a wine-glass of water, repeated three times a day.

Acid Sulphuric, aromatic (*Elixir of Vitriol*).—Medical properties and dose the same as the preceding, and used in the same kind of cases. Most agreeable form for administering the acid.

Acid Tannic.—Astringent. Used in various forms of hemorrhage when there is no fever, and in the night-sweats and diarrhœa of consumption. Also as a gargle, injection, and lotion. Dose: half a grain to two grains, in pill, or dissolved in water, several times a day.

Acid Tartaric.—Properties and uses the same as those of citric acid. Dose: ten grains to thirty, dissolved in a large quantity of water.

Aconite (*Monkshood*).—A narcotic and sedative. Used in a large number of nervous and painful diseases, as rheumatism, neuralgia and tic-douloureux, paralysis, and epilepsy. It is very powerful, and must be employed with great caution. Dose: the powder of the roots or leaves may be given in doses of three grains to twelve, thrice a day; of the extract, one to two grains, gradually increased.

Æther Nitric (*Sweet Spirits of Nitre*).—A diaphoretic, diuretic, antispasmodic, and stimulant. Employed in fevers, and in affections of the kidneys. Dose: twenty drops to a teaspoonful every two hours, in a small portion of water.

Æther Sulphuric.—A powerful diffusible stimulant and antispasmodic. Used in low fevers, hysterics, nervous headache, cramp in the stomach, flatulent colic, fainting, &c. Dose: half a teaspoonful to two teaspoonfuls, in water.

Æther Sulphuric, compound (*Hoffman's Anodyne*).—The effects the same as the preceding. Dose: the same. This is a preparation much used.

Alcohol.—Obtained by submitting a solution of grape sugar to the vinous fermentation, by which the sugar is changed into it and carbonic acid, and separated from the water by repeated distillation.

Allspice.—The oil is a powerful aromatic. Dose: two to six drops.

Aloes.—Cathartic. Used in habitual constipation, except when there are piles, and in deficient menstruation. It is generally combined with other medicines. Dose: two grains to five, made into pill.

Alum (*Alumen*).—Astringent. Used in chronic diarrhœa and dysentery, chronic mucous discharges, passive hemorrhages, sweating of hectic fever, and in some affections of the stomach. Also used as a gargle. Dose: ten grains to thirty, several times a day. It is best given in solution in some aromatic water.

Ammonia Acetate, Solution of (*Spirit of Mindererus*).—A diaphoretic. Employed very generally in febrile and inflammatory affections. Dose: half an ounce to two ounces; repeated every six hours. Commonly added to mixtures.

Ammonia Bicarbonate.—An antacid. Used to neutralize acid in the stomach. Free from the stimulating properties of carbonate of ammonia. Dose: five grains to twenty-five, dissolved in *cold* water or bitter infusions. The carbonate of ammonia may be used for the same purpose, and in the same dose.

Ammonia, Muriate of (*Sal Ammoniac*).—Stimulant and alterative. Employed in Europe in hooping-cough, mucous diarrhœa, chronic rheumatism and gout, dropsy, visceral obstructions, and in serous inflammations. It is there highly esteemed, and probably deserves to be more used in this country than it has hitherto been. Dose: from five to thirty grains, combined with gum or sugar, or in syrup. It is applied externally, as a lotion, for the cold it produces during its solution with water.

Ammoniac Gum.—Stimulant and expectorant. Used in chronic catarrh, asthma, and other affections of the lungs. Dose: two to thirty grains, three or four times a day. It is commonly administered as an *emulsion.*

Angelica.—A very pleasant aromatic tonic. Dose: of the root or seed, is from thirty grains to one drachm.

Angustura Bark.—A stimulant tonic. It has been found particularly serviceable in the bilious diarrhœas and dysenteries of hot climates; it has also been very successfully employed in the malignant fevers of the tropics. Dose: from ten to thirty grains. It is also given in infusion, tincture, and extract.

Aniseed (*Anisum*).—A pleasant aromatic carminative, that relieves pain in the bowels from flatulence, and may be used whenever the stomach requires stimulating. Used much for flavoring liquors and for making a cordial. Dose: in powder, twenty to thirty grains.

Antimonial Powder (*James' Powder*).—A diaphoretic. Employed in the early stages of febrile diseases and inflammatory affections, and combined with calomel and opium, in acute rheumatism. It is not a very certain medicine in its effects. Dose: in powder, from three grains to ten, every four or five hours. Not much used in these days.

Antimony, Sulphuret of.—A good diaphoretic and alterative. The golden sulphuret is the kind now altogether used. It is employed in diseases of the skin. Its combination with calomel and guajacum, formed into a pill known as the *compound calomel pill*, is the most popular form of administering it. Dose: five grains to ten, three times a day; of the pill the same.

Antimony, Tartarized (*Tartar Emetic*).—An alterative, diaphoretic, diuretic, expectorant, and emetic. Its different effects are produced by difference of dose, and accidental circumstances. Dose: as an alterative, frequently repeated, is from the sixteenth to the eighth of a grain; as a diaphoretic or expectorant, from an eighth to a sixth of a grain; as a nauseating sudorific, from one-fourth to one-half a grain; repeated every two hours. As an emetic, the dose is from two to three grains, given in divided portions every fifteen minutes, until free vomiting is induced. It is not much used in these days. Ipecac is preferred.

Antimonial Wine.—Properties the same as the preceding. Dose: as an expectorant or diaphoretic, is from ten to thirty drops, frequently repeated; as an emetic for *infants*, from thirty drops to a teaspoonful. Very little used of late years.

Arnica (*Arnica Montana. Leopard's Bane*).—A nervous stimulant, much used on the Continent of Europe in many nervous and painful affections. It is said to produce diuretic, diaphoretic, and emmenagogue effects. The tincture of it is much employed to allay inflammations of the skin, and in bruises and other injuries. Dose: in powder, from thirty grains to a drachm. The dose of the infusion (one ounce to a pint of water), one to two tablespoonfuls, every two or three hours.

Arrow-Root.—Much used in dietetic preparations.

Arsenic (*Ratsbane*).—A poison and tonic. Has been used in scirrhus and cancer, diseases of the skin, fever and ague, chronic rheumatism, diseases of the bones, frontal neuralgia, in epilepsy, in secondary syphilis, and many other diseases of the constitution. It is unquestionably a remedy of great value, but it should only be administered when other medicines have failed, and then with the greatest care. Dose: one-sixteenth to one-eighth of a grain, made into a pill with crumbs of bread.

Arsenical Solution (*Fowler's Solution*).—In this the arsenic is combined with potash, forming the arsenite of potassa. The properties of this preparation appear to be the same as those of arsenic, and it is commonly used as a substitute for that, on account of the greater ease and safety in apportioning the dose. Dose: five drops to ten, two or three times a day. Sometimes, if too much be given, a dropsical swelling is produced. This will subside in a few days on withholding the medicine, and using gentle purgatives and diuretics.

Assafœtida.—A powerful stimulating antispasmodic. Employed in the nervous diseases of females, in epilepsy, St. Vitus's dance, in the convulsions of infants, when dependent, especially, on flatulence, and indeed in almost every variety of spasmodic disease. It is given in several forms. Dose: ten grains or more, made into pills. It is often used as an injection in spasms. One or two drachms, rubbed up with warm water into an emulsion, may be administered at once in this way. Assafœtida is frequently combined with other medicines.

Atropine (*Atropia*).—Comes from the root of belladonna; yellowish-white crystals.

Atropia, Sulphate of.—A white powder. "Atropia and its sulphate have the same action on the system as belladonna; should not be used in larger quantities than $\frac{1}{30}$ of a grain; they are rarely used internally. A drop of a solution of the sulphate (two grains to one fluid ounce) is often put into the eye by the surgeon, to dilate the pupil."

Avens.—A tonic and powerful astringent. A native plant, used in chronic or passive hemorrhages, in whites, and in diarrhœa, in dyspepsia, and in the debility of consumption. Dose: of the powdered root, one scruple to one drachm, three times a day. The decoction is made by boiling one ounce in a pint of water; and it is given in doses of one to two fluid ounces.

Balm (*Melissa*).—Mild stimulant. Used in the form of infusion.

Barberry.—Laxative and astringent. Dose: of the powdered leaves, one teaspoonful.

Balm of Gilead (*Populus Candicans*).—Tincture of the buds is used for rheumatism. Dose: from one to four drachms.

Balmony (*Chelone*).—Cathartic tonic, and used against worms. Dose: of the powdered leaves, one drachm; of tincture, two drachms; of decoction, from one to three ounces.

Balsam of Peru.—Used externally as a local stimulant for ulcers, &c.

Balsam of Tolu.—A stimulant expectorant. Used in cough mixtures because of its agreeable flavor. Dose of tincture, half a drachm to one drachm; dose of syrup, one drachm to half ounce.

Barley (*Hordeum*).—Used as food, and as a demulcent.

Barley Water.—"Made by taking barley two ounces, washing well, then boiling for a short time with half a pint of water, then throwing the liquid away, and finally boiling with four pints of water to two pints

Used as a drink in inflammatory and febrile conditions of the system. May be flavored with lemon-juice and sugar.

Bayberry.—Astringent. Dose of tincture, half an ounce.

Bearberry (*Uva Ursi*).—Astringent and tonic. Given in diseases of the urinary organs of nearly every kind, in the chronic stage. Dose: of the powder, one scruple to one drachm, three or four times a day.

Belladonna (*Deadly Nightshade*).—Narcotic. Used in neuralgia, convulsions, epilepsy, rheumatism, dropsy, jaundice, and in a large number of nervous and painful diseases.

Belladonna Plaster.—An anodyne plaster, used for headache and other pains.

Benzoin.—The juice of the *Styrax benzoin*, which may be rarely used. Compound tincture. Dose: half fluid drachm to one.

Bethroot (*Trillium Pendulum*).—Astringent and tonic. Dose: of infusion, one to five ounces; of decoction, two to three ounces.

Bismuth (*Subnitrate, Subcarbonate. White Oxide of Bismuth*).—A tonic and antispasmodic. It is particularly useful in painful affections of the stomach and diarrhœa. When there is an aching pain of the stomach it is a very valuable remedy. Dose: three to six grains, combined with an equal quantity of powdered ginger, three times a day.

Bitter Orange Peel.—An aromatic tonic.

Bitter Root.—Laxative and diaphoretic. Dose of solid extract, one to six grains.

Black Alder (*Prinos*).—Tonic and astringent. Dose of tincture, two to three drachms.

Bitter Sweet (*Dulcamara Solanum*).—Narcotic and alterative. Commonly used in cutaneous eruptions of the scaly kind. *Decoction*, in which form it is generally used, is made by boiling one ounce in a pint and a half of water until there is left but a pint of fluid. Dose of this is two to four tablespoonfuls, three or four times a day.

Blackberry Root (*Rubus Villosus*).—Tonic and astringent. Employed in chronic diarrhœa. Used generally in the form of a *decoction*, which is made by boiling one ounce of the root in a pint and a half of water down to a pint. Dose: two ounces, several times a day.

Black Cohosh (*Cimicifuga Racemosa*).—Used in rheumatism, acute and chronic. Dose of solid extract, three to six grains; of fluid extract, half a drachm to a drachm.

Black Oak Bark.—Same as White Oak Bark.

Blood Root (*Sanguinaria Canadensis*).—Narcotic, stimulant, and emetic. This article is getting into very general use in affections of the lungs, rheumatism, jaundice, &c. Generally given in the form of *tincture*. Dose of tincture, from thirty to sixty drops, three times a day.

Black Willow (*Salix Nigra*).—A tonic. Used in ague. Dose of decotion of the buds, one to two ounces.

Blue Flag (*Iris Versicolor*).—Cathartic and diuretic. Dose: of fluid extract, ten to fifty drops; of the tincture, one to two drachms.

Boneset (*Thoroughwort*).—Diaphoretic and tonic. Used in ague, dyspepsia, and general debility. Dose: twenty grains in powder, three times a day, or it may be given in infusion. Infuse one ounce in a pint of hot water. Dose: three or four tablespoonfuls. A safe and popular domestic remedy.

Buchu (*Barosma*).—Diuretic, stimulant, and tonic, much used in disorders of kidney. Dose: of fluid extract, half a drachm to a drachm.

Bugle Weed (*Lycopus Virginicus*).—A narcotic, tonic, and astringent. Used in consumption, bleeding at the lungs, quieting irritation and allaying cough. Given in infusion, which is made by infusing one ounce of the herb in a pint of boiling water. Dose: the whole of this quantity daily.

Burdock (*Lappa Minor*).—Diaphoretic and aperient. Used in scrofulous, venereal, cutaneous, gouty, and urinary affections. The *decoction* is made by boiling two ounces of the root, seeds, or leaves in three pints of water down to two. Dose: one pint daily.

Burgundy Pitch.—This is much used in plasters.

Butterfly Weed.—(See *Pleurisy Root.*)

Butternut (*Juglans. White Walnut*).—Cathartic. A purgative. Dose: from five grains to twenty-five.

Calamus (*Sweet Flag*).—An aromatic. Dose: one scruple to one drachm.

Calomel.—(See *Mercury.*)

Camphor.—A diffusible stimulant in moderate doses; in larger, a narcotic This remedy is given advantageously in the advanced stages of typhoid fever, when nervous symptoms predominate. In all other nervous diseases it is often useful. As a liniment, it is very beneficial in local pains, and it enters into the combination of a large number of officinal preparations. Dose: two to ten grains, according to circumstances.

Canada Balsam.—Diuretic. Dose: from five to fifteen drops in emulsion.

Canada Fleabane (*Erigeron Canadensis*).—Diuretic and astringent, used in chronic urethral discharges. Dose: of infusion, one to three ounces; of powder, from twenty to fifty grains.

Canella.—A mild tonic, used in dyspepsia.

Cantharides.—(See *Spanish Flies.*)

Caraway Seeds (*Carum*).—A pleasant stomachic and carminative. Used to relieve flatulence, &c. Dose: in substance, from one scruple to one drachm. It is generally used combined with other medicines.

Cardamom Seeds (*Cardamomum*).—A stomachic and aromatic like the preceding, and used under similar circumstances and in like manner.

Carolina Pink.—(See *Pink Root.*)

Carrot.—Stimulant and diuretic. Used in affections of the kidneys and dropsy. Generally given in infusion, which is made by taking an ounce of the seeds or root, and infusing in a pint of boiling water. Dose: a pint during the day. Carrots are also much used as poultices in foul ulcers, the fœtor of which they are thought to correct.

Cascarilla (*Eleuteria*).—Aromatic and tonic. Used in dyspepsia, chronic dysentery, and diarrhœa, &c. It has a very pleasant odor. Dose: one scruple to half a drachm, several times a day. It is also administered in infusion, tincture, and extract.

Castor (*Castoreum*).—A nervine. Dose: from five to fifteen grains.

Castor Oil (*Oleum Ricini*).—Mild, but effectual cathartic. Used in inflammatory and spasmodic diseases of the bowels or of the urinary organs, in diseases of infancy and childhood, and during pregnancy and after delivery. If castor oil be at all rancid, it is very acrimonious, and causes much irritation. Dose: half an ounce to two ounces. It is best administered floating on the surface of water to which some aromatic tincture has been added.

Catechu.—Powerfully astringent and gently tonic. Used in chronic diarrhœa and dysentery, and in hemorrhages unaccompanied with excitement. Dose: ten grains to thirty, frequently repeated. It is best administered with sugar, gum arabic, and water.

Catnip (*Cataria*).—Used in colic and nervousness. Dose: of infusion, one to three ounces; of fluid extract, one to four drachms.

Caustic Potash.—"Made by evaporating the officinal liquors and running the melted potash into moulds; very deliquescent; soluble in less than its weight of water." Used as caustic.

Cayenne Pepper (*Capsicum*).—A powerful stimulant. Used in dyspepsia dependent on debility of the stomach. It is sometimes added to tonic medicines. Its most important application is in malignant sore throat and scarlet fever. The following is the formula as it is commonly administered in these cases. Two tablespoonfuls of the powdered pepper and a teaspoonful of table salt are infused for an hour in one pint of equal parts of boiling water and vinegar. It is then to be strained. Dose: a tablespoonful every half hour. This infusion is also used as a gargle at the same time. Dose: of the powder, is five to ten grains, given in pill.

Centaury, American.—Stomachic, tonic, and febrifuge. Used in dyspepsia, fever and ague, remittent fevers, and as a tonic during convalescence from acute diseases. It is generally given in infusions, made by pouring a pint of boiling water on an ounce of the herb. Dose: of infusion, two fluid ounces, frequently repeated.

Chalk, Prepared.—An antacid. Used to correct acidity of the stomach. It is commonly used in diarrhœa, in the form of mixture, when it is supposed an acid is causing the irritation. Dose of the powder, from ten to forty grains. Dose of *chalk mixture*, a tablespoonful, often repeated.

Chamomile Flowers (*Anthemis Nobilis*).—Aromatic and bitter tonic. Used chiefly in dyspepsia depending on debility of the stomach, in which it is very efficacious. It is generally given in infusion, which is made by taking two drachms of chamomile, and boiling water half a pint, infusing for twenty hours, and straining. Dose: of infusion, one to two ounces, several times a day.

Charcoal (*Carbo Ligni*).—Antiseptic. Used in indigestion, heartburn, bad breath, and also in poultices that are applied to ulcers. Dose: from one to three drachms.

Cherry Bark, *wild*.—Tonic and sedative. This is a remedy that has become very popular in the hectic fever of scrofula and consumption. It is also used in ague, dyspepsia, &c. Dose: of powder, thirty grains to one drachm. It is better given in infusion. Take of the bark, bruised, half an ounce; cold water, one pint. Let it infuse for twelve hours, and strain. Dose: of infusion, three or four fluid ounces, several times a day.

Chlorine Water.—Antiseptic. Locally to gangrenous ulcers, and in putrid sore throat. A valuable disinfectant.

Chloroform (*Chloroformum*).—Used to produce unconsciousness in surgical operations. About a teaspoonful is required; sometimes much less. Should only be used by surgeons. Used internally for headaches, neuralgia, &c. Doses of from ten to fifty drops.

Cinnamon.—A very grateful aromatic. It is generally used in combination with other medicines. Dose, in powder, is from ten grains to one scruple.

Citrate of Potash.—A sedative and diaphoretic. Dose: five to twenty-five grains.

Cleavers (*Galium*).—Diuretic. Used in disorders of the urethra and kidneys. Dose: of infusion, one to four fluid ounces.

Cloves (*Caryophyllus Aromaticus*).—Stimulant and stomachic. Used in flatulence and defective digestion. Dose: five grains to ten, in powder.

Cod-Liver Oil (*Oleum Morrhuæ*).—A tonic and alterative. Used in consumption and scrofula. Dose: a tablespoonful.

Colchicum (*Cucumis Colocynthis. Meadow Saffron*).—Cathartic and sedative. Used with great success in gout and rheumatism. It is seldom given in substance. The wine is most employed. Dose of the wine is from thirty drops to two drachms. Small doses should be administered to commence with.

Collodion.—This is gun-cotton dissolved in æther. Used to form a thin skin over raw surfaces.

Colocynth.—A powerful cathartic. A form known as the *compound extract of colocynth* is an excellent purgative, and much used. The dose of this extract is five to fifteen grains, according to the effects desired.

Coltsfoot (*Farfara Tussilago*).—Expectorant. Used in coughs and consumption. Generally given in infusion, made by infusing one ounce in one pint of water. Dose: teacupful, often repeated.

Columbo (*Cocculus Palmatus*).—Tonic. One of the best tonics we possess after acute diseases. It is used in hectic fever, and combined with aromatics in flatulent bowels. Dose, in powder, from ten to thirty grains, three or four times a day. Infusion is the best form in which to administer it.

Copaiba.—Stimulant, diuretic, and laxative. Used in whites, gleet, chronic dysentery, chronic coughs, chronic inflammation of the bladder, and especially in gonorrhœa. Dose: twenty to thirty drops, three times a day. It is very nauseous, and therefore is best mixed with gum mucilage and aromatic water, to conceal as much as possible its taste.

Compound Spirit of Ether (*Hoffman's Anodyne*).—A mild anodyne and nervous stimulant. Used to promote sleep and relieve pain.

Copperas.—(See *Iron.*)

Copper, Sulphate (*Cupri Sulphas*).—In small doses, tonic and astringent; in large, emetic. It is employed very successfully in obstinate cases of chronic diarrhœa. Dose: as a tonic, one quarter to one grain; as an emetic, from two to five grains. In large doses it is a poison.

Corrosive Sublimate.—(See *Mercury.*)

Cotton (*Gossypium*).—Used in burns. It is applied in layers over the burn.

Cowhage, or *Cowitch* (*Mucuna Pruriens*).—Vermifuge. Used to destroy worms in the bowels. For mode of administering and its dose, see *Anthelmintics*, under the head of "*Prescriptions.*"

Crawley.—Diaphoretic. Dose is from fifteen to twenty-five grains.

Cream of Tartar.—A cathartic and diuretic. It is used in dropsy, and in some febrile complaints, and combined with sulphur in piles. Dose: as a cathartic, from half an ounce to an ounce; one or two drachms will act as an aperient. It is generally mixed with molasses when it is administered.

Cranesbill (*Geranium Maculatum*).—A powerful astringent. Used in diarrhœas, and all chronic discharges. A very popular medicine and a very good one, and may be employed in all cases when an astringent is required. It is best given in decoction. Boil an ounce of the root in a pint and a half of water to one pint. Dose: from two to four tablespoonfuls, four times a day.

Creasote (*Creasotum*).—Antiseptic, etc. Used in diarrhœa, in chronic inflammations of mucous membranes, to check vomiting. Dose: from one to three drops in pill, or largely diluted in water. Carbolic acid is now taking the place of creasote.

Croton Oil (*Oleum Tiglii.*)—A powerful purgative. It acts with great rapidity. It is generally used in obstinate constipation, when other medicines have failed. Dose: one or two drops, mixed with crumbs of bread and made into a pill.

Cubebs (*Cubebæ*).—Stimulant and diuretic. Used in disease of the urinary organs. Dose: in powder, one to three drachms, repeated four times a day.

Culver's Root.—Tonic and laxative. It is also supposed to act on the liver. Leptandrin is made from it. (See *Leptandrin.*) Dose: of leptandrin, one-quarter of a grain to one grain; of the fluid extract, from one scruple to one drachm.

Cucumber Tree (*Magnolia*).—Gently stimulant, aromatic, tonic, and diaphoretic. Used in chronic rheumatism and in ague. Dose, in powder, half a drachm to one drachm.

Dandelion (*Taraxacum*).—Diuretic and laxative. Used with much benefit in disorder of the liver and stomach. It promotes the secretion of bile. It is usually given in decoction. Two ounces of fresh, or one ounce of dried root, sliced, is to be boiled with a pint of water down to half a pint. Dose: four tablespoonfuls, three times a day.

Deadly Nightshade.—(See *Belladonna.*)

Decoctions.—These are made by boiling vegetable substances in water. This should be done in a *covered* vessel. The average proportion is about one ounce of the vegetable substance to one pint of water. The difference between infusions and decoctions is, that the former are made by pouring boiling water on the substance and allowing it to stand until it cools, and the latter by actually boiling the substance.

Dewberry Root.—Used like *Blackberry Root*, which see

Digitalis (*Purple Foxglove*).—Diuretic, sedative, and narcotic. Used in dropsy, consumption, disease of the heart, epilepsy, spasmodic asthma, &c. Dose of the powder is one grain, two or three times a day. It is a powerful medicine, and its effects must be closely watched.

Dock, Yellow, and Water.—Tonic and astringent. Used very much in affections of the skin. The two kinds possess similar properties, and are used alike. The decoction is made by boiling one ounce of dried root, or two ounces of fresh, in a pint of water, four tablespoonfuls of which may be given, at a dose, four times a day.

Dog-wood Bark (*Cornus Florida*).—Tonic and astringent. Used sometimes as a substitute for Peruvian bark in ague. Administered commonly in decoction. Take of the bark, bruised, one ounce; water, one pint. Boil ten or fifteen minutes, and strain. Dose: four tablespoonfuls, four times or oftener. during the day.

Dover's Powder. (*Ipecacuanhæ et opii compositus.*)—Composed of ipecac, opium. and sulphate of potash. Diaphoretic and soporific. Dose: five to ten grains.

Elaterium.—(See *Wild Cucumber.*)

Elder Berries (*Sambucus*).—Diaphoretic and aperient. Used in gouty, rheumatic, and eruptive diseases. Dose: of the dried juice, from one drachm to half an ounce.

Elecampane Root (*Inula*).—Tonic, stimulant, and diaphoretic. Much used formerly in suppressed menstruation, and is now often employed in diseases of the skin. Dose of the powder is one scruple to one drachm. The decoction is made by boiling half an ounce in a pint of water, the dose of which is two to four tablespoonfuls, three times a day.

Ergot (*Spurred Rye*).—This medicine is specific in its action. It is almost wholly employed as a stimulant to the womb for promoting contraction during and directly after labor. It has also been employed successfully to check internal bleedings. Dose in powder, to a woman in labor, is fifteen or twenty grains, to be repeated every twenty minutes, until its effects are manifested, or until a drachm has been given.

Electricity.—A stimulating tonic. (See *Electrization, General Electrization, Localized Electrization, Galvanization, Faradaization.*) Used in dyspepsia, constipation, neuralgia, nervous exhaustion, diseases of women, St. Vitus's dance, sleeplessness, paralysis, rheumatism, etc. Used in surgery in the form of galvano-cautery.

Ether.—Used chiefly to produce insensibility in surgical operations. "Internally used as a powerful diffusible stimulant in sudden prostration; as an anodyne stimulant in colic. Dose: half to one fluid ounce, given with cold water. Externally, when allowed to evaporate, produces cold; when confined to the skin, a rubefacient and anodyne effect."

Fennel Seed.—A pleasant aromatic. Much used to correct the harshness and griping operations of other medicines. Dose: twenty to thirty grains, of the bruised or powdered seed.

Fever Few (*Pyrethrum*).—A tonic and nervine. Dose of infusion, one to four ounces.

Figwort.—Diuretic and alterative. Dose of infusion, from one to three ounces.

Flaxseed.—Infusion used as a demulcent and diluent in affections of the kidney. "The mucilage should be made by putting the seed in a little bag, one ounce to one quart, in boiling water, and allowed to *simmer*, but not boil. Lemon-juice and sugar may be added.

Fleabane.—A diuretic. Used in dropsy. Highly esteemed by some practitioners for this purpose. Administered in decoction, made by boiling one ounce in a pint of water. Dose: a wine-glassful, every three hours.

Foxglove.—(See *Digitalis.*)

Gamboge.—A powerful cathartic, sometimes employed in dropsy, generally combined with other strong purgatives; alone, it is seldom used. Dose: from two to six grains.

Gallic Acid.—"Preferable to tannic acid in hemorrhages from some remote organ, to which access is to be had only through the blood (as in hæmaturia, hæmoptysis, &c.), as it is believed to enter that fluid more readily. Dose: five to twenty grains, in powder or pill."

Garlic (*Allium Sativum*).—Expectorant. Dose: from one scruple to two drachms. Sometimes it is applied as a poultice to the feet or chest.

Gentian Root (*Gentiana Lutea*).—Tonic. It is much used when a mild and agreeable tonic is desired. Dose of the powder is from ten to forty grains. The tincture or infusion is the form in which it is usually administered.

Ginger (*Zingiber*) —An excellent stimulant and carminative, and is frequently given in dyspepsia, flatulence, and to correct other medicines. Dose of the powder is from five grains to twenty. An infusion may be made by pouring a pint of boiling water upon half an ounce of the powder or bruised root, the dose of which is two to four tablespoonfuls.

Ginseng (*Panax*).—Stimulant. Dose of root, from five to fifty grains.

Glauber's Salt.—(See *Soda.*)

Glycerine.—The sweet portion of oils. Much used as a vehicle for other remedies, especially for applications to mucous membranes.

Gold, Chloride of.—This is used by some in affections of the liver, syphilis, and rheumatism. Dose is from one-twentieth to one-tenth of a grain, in pill. The ointment of chloride of gold is sometimes applied to rheumatic joints.

Golden-rod.—Aromatic and carminative. Used in flatulence, &c. It is generally given in infusion—one pint of water to the ounce of leaves. Dose: two ounces.

Golden Seal (*Hydrastis Canadensis*). — A tonic. Used in fevers, dysentery, chronic diarrhœa, &c. Dose of *hydrastin*, which is made from it, is from one-quarter of a grain to four grains; dose of tincture, from half an ounce to two ounces.

Gold Thread Root.—Tonic. Useful whenever a tonic is needed, especially after fevers. Dose of the powder, ten to thirty grains. A tincture may be made by adding a pint of diluted alcohol to an ounce of the root, the dose of which is a teaspoonful.

Guaiac.—Stimulant and diaphoretic. Used much in rheumatism, gout, secondary syphilis, scrofula, cutaneous eruptions, and in suppressed menstruation. Dose, in powder, is from ten to thirty grains; of the tincture, one to three teaspoonfuls.

Gum Ammoniac.—(See *Ammoniac.*)

Gum Arabic.—This is used to make mucilage. It is an excellent vehicle for other medicines, especially those of an irritating character.

Gum Hemlock.—Used for plasters.

Hardhack Root.—Tonic and astringent. Used in diarrhœa, cholera infantum, dyspepsia, &c. It is thought to be superior to many other astringents in ordinary cases. A decoction is made by boiling an ounce of the root in a pint of water, the dose of which is one to two ounces, three or four times a day.

Hellebore, Black.—Powerful cathartic. Used in dropsy, and in promoting the monthly discharge of females, for which it is highly esteemed. It has been used in diseases of the brain and of the skin. Dose: of tincture, one to two drachms; of powder, five to fifteen grains, as a cathartic.

Helonias.—Diuretic and tonic. Dose: of the fluid extract, one to two drachms; of *helonin*, which is made from it, the dose is from a quarter of a grain to a grain.

Hemlock (*Conium*).—A narcotic. Used in diseases of the skin, scrofula, chronic rheumatism, neuralgia, chronic coughs, &c. Dose of the powdered leaves, three or four grains twice a day. As the system soon becomes accustomed to its use, it is necessary gradually to increase the dose, that its effects may be maintained.

Henbane (*Hyosciamus Niger*).—A narcotic, acting occasionally on the skin, or kidneys and bowels. Used in all kinds of painful nervous diseases,—in chronic rheumatism, chronic coughs, in hysterics, and, in short, in every kind of case in which opium is employed. It is not so potent as opium, and it is sometimes borne when opium cannot be tolerated. Dose of powdered leaves, five to ten grains. Dose of the tincture is a teaspoonful for ordinary effects.

Hops (*Humulus Lupulus*).—Tonic and narcotic. Used in dyspepsia, the nervousness of drunkards, and to allay pain. They may be used in an infusion, made by pouring a pint of boiling water on half an ounce, in the dose of four tablespoonfuls four times a day. Dose of the tincture is half a teaspoonful to two teaspoonfuls.

Horehound (*Marrubium Vulgare*).—Tonic. Used much in common practice in coughs, colds, &c., and in cases of debility. Generally given in infusion, made with an ounce of the herb to a pint of boiling water. Dose: a wine-glassful several times a day.

Horsemint (*Monarda Punctata*).—Diuretic, carminative. Used for flatulence. Dose: of the oil, from one to four drops on a lump of sugar.

Horseradish (*Armoracia*).—Anti-scurvy medicine. Stimulant. Used in the form of infusion. Dose: from one to three ounces.

Hydrangea.—Diuretic. Dose: of fluid extract, one drachm.

Hydriodate of Potassa.—(See *Potassium.*)

Hyssop.—Carminative and tonic. Used in coughs. Dose of infusion, one to four ounces.

Iceland Moss (*Cetraria Islandica*).—Tonic and demulcent. Used for coughs. Dose: of decoction, from one to four ounces.

Indian Turnip (*Arum Tryphyllum*).—Expectorant. Used for coughs and rheumatism. Dose: of the root, from three to twelve grains, in syrup.

Iodide of Potassium.—The action of this salt on the system is very similar to that of iodine. Used in chronic rheumatism, tertiary syphilis, &c. Dose: five to fifteen grains, in water. It should, as a rule, be taken after meals.

Iodine (*Iodium*).—Special stimulant of the glandular system. Used in glandular enlargements; scrofula of every variety; chronic enlargement of the liver, spleen, and ovaries; in cutaneous diseases, and in consumption. As an ointment, it is applied to many diseases of the skin, enlarged glands, chronic swellings of the joints, &c. It is not administered in substance. The dose of the *tincture* is five to twenty drops, two or three times a day, in half an ounce of water syrup. The *iodide of potassium* is generally employed in preference to this preparation.

Ipecacuanha.—In large doses, emetic; in smaller, diaphoretic and expectorant; and in minute doses it acts as a stimulant to the stomach. As an emetic it is preferable to all others when there is irritation of the stomach, or for children and persons who are feeble. It may be given in very large doses without causing any dangerous consequences. In small doses, especially when combined with opium, it acts with great certainty on the skin. It appears to possess some specific tendency to the mucous membranes, by which their secretions are improved. It has been used with much success in dysenteries and diarrhœas, and it is an admirable expectorant, not always by increasing expectoration, but by bringing the lining membrane of the lungs to the condition of health. Dose: as an emetic, twenty to thirty grains, which may be repeated in twenty minutes; as a diaphoretic and expectorant, half to one grain, every three hours.

Irish Moss.—"A sea-weed growing on the rocks on the coasts of Ireland and Northern Europe. Odor and taste feeble; yields to boiling water. Used as demulcent article of diet in various inflammatory affections. Decoction, half ounce to one quart. Dose: one fluid ounce to three, every three or four hours."

Iron (*Ferrum*).—The general effects of all the different preparations of iron employed for medical purposes are powerfully tonic, exciting the pulse, increasing the secretions, and adding to the coloring material of the blood. They are used in most female affections that are characterized by paleness and debility, in all exhausting discharges, in restoring the menstrual evacuation, in scrofula, rickets, neuralgia, &c. Iron should not be employed when active inflammation exists, nor in diseases of excitement.

IRON, BLACK OXIDE OF.—Possesses the general properties described above as belonging to iron. Dose: from five to twenty grains, three times a day.

IRON, PRECIPITATED CARBONATE OF.—This is a very mild and excellent preparation. Dose: as a tonic and for ordinary cases, five to twenty grains; in neuralgia, half a drachm to a drachm or more, three times a day. It is a good plan to add a few grains of ginger and a grain or two of rhubarb to each dose. It may be administered in syrup or molasses.

IRON, AMMONIO-CITRATE OF.—Another agreeable preparation that is getting into very general use, as it answers all the ordinary purposes of iron, while it is less offensive to the palate than most of the others. Dose: five to eight grains, always in solution.

IRON, AMMONIO-TARTRATE OF.—This preparation is nearly void of all astringency, and is more agreeable to the taste than many others. Dose: five to eight grains, in powder, pill, or solution.

IRON, IODIDE OF.—This preparation is better suited to scrofula, and other cases in which iodine is indicated, combined with a tonic. Dose: two to five grains, gradually increased, three times a day.

IRON, THE MURIATE TINCTURE OF.—Strongly astringent. Used, in addition to the common purposes, in affections of the urinary organs, and in the chronic mucous discharges of females, and in passive hemorrhages from the kidneys and bladder. Dose: ten to thirty drops, gradually increased to one-drachm, in a little water.

Other and recent preparations of iron are the *pyrophosphate; citrate of iron and quinine; iodide, lactate, and powder of iron; tartrate of iron and potash.*

JALAP.—An active cathartic, causing watery stools. It is usually combined with other cathartics, as calomel, for bilious fevers; and cream of tartar, for dropsy. Dose: in powder, ten to twenty grains.

JAMES' POWDER.—(See *Antimonial Powder.*)

JAMESTOWN WEED.—(See *Thorn Apple.*)

JERUSALEM OAK.—(See *Wormseed.*)

JUNIPER BERRIES.—Stimulant and diuretic. Used in dropsy, disease of the bladder, and diseases of the skin. Best given in infusion, which is made by pouring a pint of boiling water on an ounce of the bruised berries. Dose: the pint in twenty-four hours.

KAMEELA.—The powder and hairs obtained from the capsules of *Rottlera tinctoria* of Southern Asia. A light, finely-granular, brownish-red powder, with little smell or taste, producing some acrimony in the mouth; contains a crystallizable principle—rottlerin; active principle, a resin. Used against the tape-worm in dose of one drachm to three, in emulsion or tincture.

KINO.—An intense astringent. Used in chronic dysentery, whites, and in hemorrhages, when there is no excitement. It is generally combined with opium, chalk mixture, &c. Dose: of the powder, from ten to thirty grains. It may be given in infusion.

KOUSSO.—The flowers and unripe fruit of *Brayera Anthelmintica* of Abyssinia. Greenish yellow; odor fragrant; taste slight at first, afterwards acrid, disagreeable. Given in cases of tape-worm, in half-an-ounce dose, mixed with water.

LACTUCARIUM.—The inspissated juice of the *Lactuca sativa*, or garden lettuce, a brownish solid, with somewhat resinoid fracture. It has been thought to resemble opium in its action on the economy, except in its not producing constipation. Its action is, however, very uncertain. Dose: ten to fifteen grains. Syrup (one ounce to one pint) sometimes used as an anodyne vehicle in cough mixtures. Dose: two fluid drachms to half a fluid ounce.

Ladies' Slipper (*Cypripedium Pubescens*).—Nervine and tonic. Dose: of tincture, half an ounce to an ounce.

Laudanum.—(See *Opium.*)

Lavender.—An aromatic and stimulant. It is generally used to render other medicines more grateful, and in perfumery.

Lead, Sugar of (*Plumbi Acetati*).—Powerfully astringent and sedative. Used in bleedings from the lungs, stomach, and womb (in which it is an excellent remedy); in chronic dysentery, diarrhœa, and cholera infantum, and Asiatic cholera. It sometimes has been known to cause *painters' colic* and *lead palsy* when long continued. It is nearly always combined with opium. Dose: one to two grains in pill, which may be repeated every two or three hours.

Lettuce (*Lactuca Sativa*) —A narcotic. It lulls pain and produces sleep. Its action is much like that of opium, without affecting the head, or causing constipation, like that drug. It is mostly used to allay cough and quiet nervous excitement. It is used as a kind of extract, the dose of which is two grains.

Liquorice.—Demulcent. Used for coughs, combined with other medicines.

Lime (*Calx*).—There are several preparations of this alkali employed in medicine. It is generally used to correct acidity of the stomach.

Lime, Carbonate of (*Chalk*).—An antacid. Nearly always given combined with other medicines. It is much used in chalk mixture. Dose: from ten grains to a drachm.

Lime Water (*Aqua Calcis*).—Antacid, tonic, and astringent. Used in dyspepsia, with acidity of the stomach, diarrhœa, sick stomach; and externally as a wash to eruptions, foul ulcers, &c. When employed internally, it is best given combined with an equal quantity of milk, which quite conceals its disagreeable taste. Dose: two to four ounces, several times a day. For nausea, a tablespoonful, mixed with milk, may be given every fifteen minutes.

Lime, Chlorinated.—One of the best of disinfectants.

Liverwort (*Hepatica Americana*).—Mild tonic, astringent, and diuretic. Much used in bleeding from the lungs, consumption, cough, and liver complaints It may be drank in infusion, in any quantity, as a common beverage.

Lobelia (*Lobelia Inflata. Indian Tobacco*).—Emetic, diaphoretic, expectorant, and sometimes cathartic. It has been much used in coughs, asthma, whooping cough, and in the latter stages of croup. Dose of the powder, five to twenty grains. It is seldom given in this form, the tincture being much more agreeable. This is made by taking four ounces of lobelia and two pints of diluted alcohol, leaving them to stand together fourteen days, and then straining. Dose: thirty drops to two teaspoonfuls, every three or four hours.

Logwood (*Hæmatoxylon Campechianum*).—A pleasant astringent. Used in chronic diarrhœa, chronic dysentery, and in the chronic bowel complaints of young children. It is a very good remedy, and much employed. The decoction, in which form it is best given, is made of one ounce of rasped logwood, and two pints of water boiled to one pint. The dose is four tablespoonfuls; for a child two years of age, two teaspoonfuls, several times a day.

Magnesia, Calcined.—This is used for the same purposes and in the same manner as the carbonate of magnesia.

Magnesia, Carbonate of.—An antacid. Used in sour stomach. By combining with the acid in the stomach it is slightly purgative. Dose: half a drachm to two drachms, mixed with milk or water, and a little syrup.

Magnesia, Sulphate of (*Epsom Salts*).—An excellent cathartic, producing watery stools, without pain; used generally in inflammatory diseases and fevers. Dose: one ounce, or more.

Male Fern (*Aspidium Filix Mas*).—Tonic and astringent. It has had a high reputation for destroying worms, especially the tape-worm. Dose of the powder is from one to three drachms, to be given with molasses every morning and evening, for one or two successive days. It is customary to administer a brisk cathartic directly afterwards.

Mallows (*Althea*).—Used in colds, dysenteries, and complaints of the kidneys and bladder, for its demulcent properties. The decoction may be drank in any quantity.

Mandrake (*Podophyllum*).—Cathartic, used to operate on the liver as a substitute for calomel. Dose of the *podophyllin*—which is the active principle—from one-quarter of a grain to two grains. Dose: of fluid extract, half a drachm to one drachm; of tincture, one to three drachms.

Manna.—A mild laxative, but producing sometimes flatulence. It is usually given to children and pregnant women. It is commonly combined with senna, rhubarb, salts, &c., the taste of which it conceals. Dose: from one to two ounces; for children, one to two drachms. It may be dissolved in water.

Matico.—Styptic. Leaves are used to stop bleeding. Dose: of tincture, one drachm to one ounce.

May-Apple Root.—An active cathartic. It acts much like jalap, and is generally used in the same manner and for the same purposes. Dose: of powder, ten to twenty grains. There is also an *extract.*

May Weed (*Wild Camomile*).—Given in nervous diseases, and in coughs and colds, to produce perspiration. It may be drank in infusion freely. Dose: four tablespoonfuls several times a day.

Meadow Saffron.—(See *Colchicum.*)

Mercury (*Hydrargyrum*), **Chloride of** (*Calomel*).—Cathartic, although seldom employed alone. It stimulates the liver and every secreting organ in the body, and increases their action. It is useful in bilious fevers, jaundice, bilious colic, dysentery of hot climates, and indeed in nearly every disease in which there is a derangement of the secretions. Dose: as a purgative, from five to fifteen grains; to produce a constitutional effect, half a grain to a grain every night, followed in the morning by a gentle cathartic.

Mercury, Bichloride of (*Corrosive Sublimate*).—In large doses it acts on the bowels; in smaller, it produces the specific action of all the mercurial medicines. It is less liable to salivate than calomel. It is generally used internally as an anti-venereal combined with other medicines, and in many diseases of the skin, and in obstinate chronic rheumatism. Dose: from one-eighth to one-fourth of a grain, repeated three or four times a day. It is a *corrosive poison* in large doses.

Mercury, Pill of (*Blue mass*).—This is one of the mildest preparations of mercury, and is commonly used to obtain the alterative effects. Dose: one pill of five grains may be given night and morning, with an occasional laxative.

Mercury with Chalk.—This is also a very mild combination. It is generally given to children, and to persons of irritable bowels. Dose: for a child, five grains, twice a day, mixed with thick syrup. None of the preparations of mercury are now as much used as formerly.

Mezereum.—A bark.—Stimulant and diaphoretic.

Milkweed.—Diuretic and cathartic. Dose: of tincture, one to three drachms; of infusion, two to five drachms.

Monsel's Salt. *Used to stop bleeding.*—The powder is applied directly to the wound.

Monk's-Hood.—(See *Aconite.*)

Motherwort (*Leonurus Cardiaca*).—Nervine. Used for sleeplessness. Dose: of infusion, from one to four ounces.

Mountain Laurel (*Kalmia*).—Narcotic and sedative. Used for neuralgia. Dose: of tincture, from five to fifteen drops.

Mullein (*Verbascum Thapsus*).—Demulcent. Used for coughs and sore throat. Dose of infusion, from one to three ounces.

Musk.—Stimulant and antispasmodic. Used in all spasmodic diseases, and in typhus, when there is twitching and tremors. It is not much employed on account of its high price. Dose: ten grains every two or three hours.

Mustard.—A stimulant. Has been used in dyspepsia, particularly the white mustard seed, taken whole in the quantity of a tablespoonful, two or three times a day. Two teaspoonfuls or more make an excellent emetic in cases of narcotic poisoning, by being mixed with a tumbler of warm water. It is also an excellent emetic in the beginning of Asiatic cholera, when the stomach is oppressed with undigested food.

Myrrh.—Stimulant tonic. Used in chronic coughs, consumption, asthma, and in various affections connected with disordered function of the womb. It is generally combined with iron, or aloes, or other medicines. Dose: from ten to thirty grains. There is a large number of formulæ into which it enters in the Pharmacopœia.

Naphtha.—Used chiefly for inhalations.

Nitrate of Potash (*Potassæ Nitras. Nitre*).—A diuretic and diaphoretic. It is used in active hemorrhages, fevers, and all diseases of excitement. Dose: five to fifteen grains, dissolved in water.

Nitrate of Silver (*Argenti Nitras. Lunar Caustic*).—A tonic and antispasmodic. It has been chiefly employed, beneficially, in epilepsy and dyspepsia, when there is irritation of the stomach. It is much used by surgeons externally. Dose: one-eighth of a grain, gradually increased to four or five grains, three times a day, in a pill. It should not be continued longer than two months.

Nutgalls.—Pure astringent. Only used for the manufacture of tannic acid. Dose: of powder, ten to twenty-five grains.

Nux Vomica (*Strychnos Nux Vomica*).—Tonic. Used in paralysis and debility. At present very much used, especially in the form of its active principle—*strychnine*. Dose of strychnine, from one-thirtieth to one-eighth of a grain. Dose of tincture, from five to ten drops; of fluid extract, from three to fifteen drops.

Oak Bark.—Astringent and tonic. This bark is obtained from the white oak. It has been given internally in chronic diarrhœa, and hemorrhages when there is no excitement. It is best administered in a *decoction*, made by boiling one ounce of bark in a pint of water. Dose: two to four tablespoonfuls, four times a day. It is, however, generally used externally, and as injections for whites, &c.

Oil of Amber.—A nervous stimulant. Used in hiccough, hysteria, whooping-cough, and convulsions of children. Dose: five to ten drops, in emulsion.

Oil of Anise.—Stimulant. This, and nearly all the other volatile oils, are chiefly used to flavor or to improve and correct the griping action of other remedies. They are generally useful in flatulence and pain in the stomach, when a stimulant is required. Dose: five to ten drops.

Oil of Cajeput.—Antispasmodic and stimulant. Used for hysteria, cramp, colic, &c. Dose: from one to four drops on sugar.

Oil of Caraway.—Stimulant. Dose: one to ten drops.

Oil of Cinnamon.—Stimulant and cordial. Dose: one to two drops.

Oil of Cloves.—Stimulant. Dose: two to six drops.

Oil of Juniper.—Stimulant and diuretic. This oil is used sometimes, in connection with other medicines, in dropsies of debilitated subjects. Dose: five to fifteen drops, three times a day.

Oil of Partridge Berry.—Stimulant. Used to flavor, having that of *wintergreen*.

Oil of Pennyroyal.—Stimulant, &c. Dose: two to ten drops.

Oil of Peppermint.—Dose: one to three drops. Essence of peppermint is made from it. Dose: ten to twenty drops.

Oil of Rue.—Stimulant and antispasmodic. Has been used in hysterics and convulsions. Dose: two to five drops.

Oil of Sassafras.—Stimulant, &c. Much used. Dose: two to ten drops.

Oil of Savine.—Stimulant. It has been much employed by empirics to restore the monthly discharges of females, and to produce abortion, and sometimes with fatal consequences. Dose: two to five drops.

Oil of Turpentine.—Stimulant, antispasmodic, diuretic, and vermifuge. It is used in chronic diseases of the urinary passages, and in whites, gleet, ulcerations; particularly in typhoid fever, rheumatism, and bleeding from the stomach and lungs. It is an excellent remedy also for worms in the bowels; and given conjoined with castor-oil, when free purging is desired, will be of much advantage. In convulsions it is often the best remedy we possess, in which case it may be used as an injection; hysterics it will frequently relieve almost instantly, administered in the same manner. It sometimes occasions much irritation of the kidneys and bladder, if given in an overdose. Dose: five drops to twenty drops as a diuretic; as a vermifuge, it may be given in an ounce dose, As an injection, an ounce may be used with starch-water, &c.

Oil of Vitriol.—(See *Acid, Sulphuric.*)

Olive Oil (*Oleum Olivæ*). Sometimes given internally, as nourishing food, in doses of from one to three ounces.

Onion (*Allium Cepa*).—Roasted onions are much used in poultices, and are applied to the feet, to boils, &c.

Opium.—A stimulant and narcotic. It is impossible here to allude to all the diseases in which this drug has been found serviceable. There is scarcely any malady in which, under certain conditions, it has not been useful. Its most common applications are to allay pain, to tranquillize the nervous system, and to produce sleep. If given in small doses, it acts as a decided stimulant; in larger doses it acts as a sedative and causes sleep. It generally causes constipation, and in chronic diarrhœas it is much employed to relieve the pain and check the discharge. It is a valuable remedy in rheumatism, in gout, in inflammatory diseases, after the system has been prepared for it by reducing; in cholera, in spasmodic affections, &c. Dose: half to one grain is the usual quantity; of *laudanum*, twenty drops. It is an ingredient in a very large number of preparations directed in the Pharmacopœia.

Orange Flowers.—Contain volatile oil. Used as a vehicle.

Orange Peel (*Aurantii Cortex*).—Carminative, but chiefly used to flavor other medicines. Dose: syrup in almost any quantity.

Origanum.—A popular remedy for suppressed menstruation. The oil is used for liniments.

Paregoric Elixir (*Camphorated Tincture of Opium*). — This is an agreeable anodyne and antispasmodic, and much used to quiet cough, to relieve pain in the bowels, and is given to infants to induce sleep. The dose for an infant is from five to twenty drops; for an adult, one to two teaspoonfuls.

Pareira—The root of the *Pareira brava* of South America. Similar to buchu. Dose: one fluid ounce to two.

Parsley Root (*Petroselinum Sativum*).—Aperient and diuretic. Used in affections of the kidneys, and in dropsy. It is well spoken of by high authorities. It is administered in infusion. Two ounces may be added to one pint of boiling water, and allowed to stand for two or three hours. Dose: two to four tablespoonfuls, frequently repeated.

Pennyroyal (*Hedeoma*).—Stimulant and aromatic. When taken as a warm tea it promotes perspiration. It is given in flatulent colic and sick stomach, and it is sometimes used in domestic practice to promote the monthly discharge. A large cupful may be taken at bedtime for this purpose.

Pepper, Black.—A warm stimulant. It is given in debility of the stomach, and has been accounted a good remedy in ague. Dose: five to twenty grains.

Peppermint (*Mentha Piperita*).—A stimulant and aromatic. It is useful to relieve pains in the stomach and flatulence, and for giving an agreeable flavor to other medicines. It may be given in infusion, but the essence or oil is more in common use.

Pepsin.—Made from the stomach of calf, used for dyspepsia and diarrhœa. Dose: from one to five grains.

Persimmon (*Diospyros Virginiana*).—Astringent. Used in dysentery and diarrhœa. Dose: of infusion, a tablespoonful.

Peruvian Bark (*Cinchona*).—An admirable tonic and febrifuge. There is no medicine belonging to the class of tonics so extensively used as this. It may be given in any of the diseases of debility in which tonics are indicated; but its chief value is derived from its power in checking fever, especially ague, and relieving all affections of a *periodical character*. Dose: in ague, one drachm, to be repeated every four hours during the intermission; in other affections, as a tonic, ten to thirty grains. *Sulphate of Quinine*, which is prepared from it, being so much more convenient to administer, has nearly superseded its employment. It is also given in decoction, infusion, and tincture.

Petroleum.—Stimulant and antispasmodic. Used externally for rheumatism in the form of liniment. Used for tape-worm. Dose: from ten to forty drops.

Phosphate of Soda.—"A mild saline. Used for children on account of its taste. Dose: one ounce. May be given in broth or soup."

Phosphorus.—Stimulating tonic. Chiefly used in the form of the *phosphate of iron, pyrophosphate of iron, and phosphoric acid.*

Phosphate of Iron.—Dose: from one to three grains.

Pink Root (*Spigelia Marylandica. Carolina Pink*).—A vermifuge. For destroying worms we have in this country perhaps no remedy equal to it. Dose of the powdered root for a child three or four years of age, from ten to twenty grains; for an adult, from one to two drachms, to be repeated morning and evening for several successive days, after which an active cathartic should be administered. It is more generally, however, given in infusion, for a form of which see *Prescriptions*, under the head of "*Anthelmintics.*"

Pipsissewa (*Chimaphila Umbellata. Winter Green*).—Diuretic, astringent, and tonic. Used in dropsy, and affections of the kidneys and gravel, scrofula, ulcers, and diseases of the skin. It is a very popular remedy, and is much employed in all the empirical preparations recommended for diseases of the blood. Its flavor is particularly pleasant. The decoction is made by boiling two ounces of fresh leaves with three pints of water down to a quart. Dose: a teacupful three times a day.

Plantain (*Plantago*).—The bruised leaves are applied to the bites of insects.

Pleurisy Root (*Asclepias Tuberosa*).—Expectorant and diaphoretic. It is much used in some parts of the country in common colds, pleurisy, consumption, and other affections of the lungs; also in rheumatism, in dysentery, flatulence, and indigestion. *Decoction*, made by boiling one ounce in a quart of water; a teacupful may be taken every three hours, until it produces its effects.

Prepared Oyster Shell.—Pulverized. About same as prepared chalk.

Poison Oak (*Rhus Toxicodendron*).—Used for chronic rheumatism. Dose of tincture, from three to six drops.

Poke Berry (*Phytolacca Decandra*).—It is purgative and emetic, in large doses. Used chiefly in chronic rheumatism, for which it has a high character. Generally administered in *tincture*, made by saturating brandy with the berries. Dose: a teaspoonful thrice daily. Poke berries have also been used externally as an ointment in piles and diseases of the skin.

Potash, Acetate of.—Diuretic and cathartic. Used in dropsies. Dose: one scruple to two drachms.

Potash, Bicarbonate of.—An antacid and diuretic. Used in acid stomach, and in gravel when the deposit is *red* sand. It is commonly used, also, for making an *effervescing draught*. Dose: ten to forty grains.

Potash, Sulphate of.—Cathartic. Used when there are glandular obstructions in the abdomen, especially in children, indicated by swelling. It is advantageous to combine it with aloes, rhubarb, or some other similar purgative. Dose: a scruple to half a drachm for an adult; five grains to ten for a child three or four years old.

Potash, Supertartrate of.—(See *Cream of Tartar.*)

Potassium, Iodide of (*Hydriodate of Potash*).—Used in cases similar to those in which *iodine* is employed. It is, however, more convenient to administer, and therefore more generally prescribed for internal use. Dose: one to two grains, dissolved in water, twice a day, in all scrofulous complaints and glandular enlargements. It is applied externally as an ointment.

Potassa with Lime (*Vienna Paste*).—Made by mixing an ounce of potassa and lime. Used as a caustic.

Potassium, Bromide.—Used in sleeplessness, nervousness, epilepsy, insanity, and nearly all nervous disorders. Dose: from five grains to two drachms, largely diluted in water.

Potash, Liquor.—Used as an antacid in dyspepsia, and for inflammations of the urethra. Dose: from ten to thirty drops in water.

Potash, Bitartrate, or Cream of Tartar.—Used as a cooling diuretic. Dose: as a purgative, one to two ounces.

Potash, Chlorate of.—Used for inflammation of the mucous membranes of the mouth, nose, and throat. Dose: from *five to twenty grains.* Used as a gargle in doses of one drachm to one ounce of water. It dissolves best in tepid water.

Prickly Ash (*Xanthoxylum Fraxineum*).—A stimulant and diaphoretic. Used in chronic rheumatism and diseases of the skin. Dose: ten grains to half a drachm, in powder, three times a day.

Puccoon.—(See *Blood Root.*)

Pumpkin Seeds.—Used for worms, and especially for the tape-worm. Dose of the infusion, as much as the patient will drink; dose of the oil, from five to ten drops.

Quassia.—A tonic. Used when a mere tonic is required, in dyspepsia and in the debility succeeding fevers. Given in infusion, which is made by infusing two drachms of quassia chips in a pint of cold water for twelve hours. Strain, and give four tablespoonfuls three or four times a day.

Queen of the Meadow (*Eupatorium Purpureum*).—Used for gravel, rheumatism and gout, strangury, &c. Dose: of the decoction, from one to five ounces.

Queen's Root (*Stillingia*).—Used for syphilis, rheumatism and scrofula, and diseases of the skin. Dose: of the tincture, one to two drachms; of the syrup, one to three drachms; of the fluid extract, three to ten drops.

Pyrophosphate of Iron.—This preparation is now much used.

Quinine, Sulphate of.—Prepared from Peruvian bark, which see for ascertaining its medicinal properties and uses. Twelve grains of quinine are considered equal to an ounce of bark. Dose as a tonic, one grain three or four times a day; in ague it may be given in two to five grain doses every three hours, during the intermission of the disease.

Rhatany (*Krameria*)—A powerful astringent, and moderate tonic. Used in chronic diarrhœa and dysentery; hemorrhage without excitement, especially from the kidneys; whites, and in every case in which the vegetable astringents may be employed. It is usually administered in decoction, which may be prepared by boiling an ounce of the root, bruised, in a pint of water. Dose: two to four tablespoonfuls, repeated according to the necessity of the case.

Rhubarb (*Rheum*).—Tonic, cathartic, and astringent. This is one of the best of cathartics when the bowels are in a debilitated condition, but from its astringency it is calculated to induce constipation; for this reason it is often useful in diarrhœas that are caused by irritating matter in the intestines, and is highly serviceable in the bowel affections of infancy and early childhood. It is generally given in combination with other medicines, as calomel, aloes, magnesia, &c. In fevers it is inferior to other cathartics, unless in the advanced stages, when the system is much reduced. Dose: twenty to thirty grains as a purgative; as a laxative, five to ten. For infants the syrup may be used, the dose of which is a teaspoonful or two.

Rochelle Salt.—A cooling purgative, more agreeable than the common cathartic salts. Dose: one ounce or more.

Rue (*Ruta*).—Stimulant, antispasmodic, and diaphoretic. Used in hysterics, flatulent colic, and suppressed menstruation. On account of its irritating properties, it requires to be administered with caution. Dose of powder, fifteen to thirty grains three times a day. It may be given in infusion, made by adding a pint of hot water to one ounce of the leaves. Dose: two tablespoonfuls three times a day.

Rose (*Rose-water*).—Used for eye-washes. The leaves are sometimes applied to the eye.

Rosin.—Used in ointments and plasters.

Saffron (*Crocus Sativus*).—Stimulant, antispasmodic; and it is thought to possess the property of stimulating the womb and causing the menstrual flux. It is now chiefly used in domestic practice to promote the eruption in measles, &c. Dose: ten to thirty grains.

Sage (*Salvia*).—Diaphoretic and tonic. Used for indigestion, and for colds, Dose of the infusion, from one to four ounces. It is a very popular ingredient of gargles.

Sago.—Its uses and manner of preparation like those of tapioca.

Saleratus.—(See *Bicarbonate of Potash.*)

Salicin.—(See *Willow Bark.*)

Salt, Epsom.—(See *Magnesia, Sulphate of.*)

Saltpetre.—(See *Nitrate of Potash.*)

Santonine.—"The unexpanded flowers of *Artemisia contra* and other species. Two varieties: Barbary; covered with whitish down. Levant; green, without down, odor aromatic, taste bitter, peculiar. Active principle *Santonin* (*Santoninum*, U. S.), crystallizable, nearly insoluble in water: soluble in alcohol and æther, colorless, forming salts with alkalies. An active vermicide. Dose of santonica, ten to thirty grains; of santonine, two to three grains, followed by cathartic. Volatile oil; yellowish, darkening with age. Dose: five to twenty drops."

Sarsaparilla.—Diaphoretic. Used in cutaneous eruptions and secondary syphilis. It has become, through the agency of advertised nostrums, a medicine of great repute in a large variety of affections. It is given in infusion or decoction, combined with other ingredients. Dose: of powder, from one to three drachms. See *Prescriptions*, under the head of "*Diaphoretics*," for a recipe for decoction.

Sassafras Root (*Smilax*).—Diaphoretic. Never prescribed alone, but it is generally added to the sarsaparilla preparations.

Savin (*Sabina*).—Emmenagogue. Used to bring on the courses. Dose of tincture, half an ounce to one ounce and a half; of the oil, from one to four drops on sugar. A very dangerous medicine.

Scammony.—Powerful cathartic. In consequence of the difficulty of obtaining it pure, it is now but little used. Dose: eight to ten grains.

Scull-cap (*Scutellaria*).—Antispasmodic, nervine, and tonic. Used for sleeplessness, nervous debility, &c. Dose: of tincture, from one to three drachms; of the fluid extract, from quarter of a drachm to a drachm. Dose of *Scutellaria*, from one to five grains.

Scurvy Grass.—Gently stimulant, aperient, and diuretic. Used in sea-scurvy, chronic rheumatism, &c. It may be eaten as a salad, or it may be administered in tincture, in the dose of thirty or forty drops, several times a day.

Seidlitz Powders.—These are made of Rochelle salts two drachms, and bicarbonate of soda forty grains, in a *blue* paper; and in the *white* paper, thirty-five grains of tartaric acid. Dissolve the contents of each paper in half a tumbler of water. Pour one into the other, and drink as it effervesces.

Senna (*Cassia*).—An active cathartic. It may be used in all cases requiring a thorough purging, especially in the early stage of fevers and in inflammatory affections. It is commonly combined with Epsom salts, manna, &c. As it has a tendency to gripe, some aromatic should always be added to it. The infusion is prepared by pouring two ounces of boiling water on two to four drachms of the leaves, and allowing it to stand for thirty minutes. The whole for a dose. It may be sweetened with sugar to render it more palatable.

Silk Weed (*Milk Weed*).—Its effects, uses, and doses are the same as those of the *Butterfly Weed*, which see.

Simaruba.—Bark of a Jamaica tree. Similar in properties to quassia. Contains quassin.

Skunk Cabbage Root.—Stimulant and antispasmodic. Used in asthma, hysterics, rheumatism, and chronic cough. Dose of the powder, from ten to twenty grains four times a day.

Slippery Elm.—Demulcent and expectorant. Used for coughs and colds. It is frequently made into a poultice. Used as emollient in form of poultice, made with ground bark, or in thick mucilage, in various external inflammations; as demulcent in dysentery.

Snake-root, Black.—Tonic, diaphoretic, diuretic, and antispasmodic. Used in dropsy and rheumatism. It is probably one of the most valuable of our native plants. The decoction is made by boiling for ten minutes an ounce of the bruised root in a pint of water. Dose: two to four tablespoonfuls several times a day.

Snake-root, Seneka.—Stimulating expectorant and diaphoretic. It is much used in affections of the lungs, and in large doses it has been successful in rheumatism. Dose of the powder is ten to twenty grains, but it is usually given in decoction or prepared as a syrup with squills and antimony. To make the decoction, take bruised seneca, one ounce; water, two pints; boil down to a pint and strain. Liquorice root may be added before boiling to improve the taste. Dose: four tablespoonfuls three times a day.

Solomon's Seal (*Convolaria*).—Astringent and tonic. Used in dysentery. Dose of the decoction, from one to five ounces.

Snake-root, Virginia.—Stimulant tonic, diaphoretic, and diuretic. It is used in typhoid fevers, in ague, in obstructed menstruation, and for promoting the eruption in measles, scarlet fever, &c. Administered generally in infusion and tincture. To make the infusion, take half an ounce of snake-root and a pint of boiling water; infuse for two hours and strain. Dose: two to four tablespoonfuls, repeated every hour or two in low fever; three times a day or oftener in other affections.

Soda, Bicarbonate.—An antacid. Used in gravel when the deposit is *red*, and in acidity of the stomach. Dose: ten grains to one drachm dissolved in a little water.

Soda, Carbonate.—Like the preceding in its general properties. It has been administered in scrofulous affections, whooping-cough, gravel, dyspepsia, &c. Dose: from five to fifteen grains three times a day.

Soda, Sulphite of.—Antiseptic. Used against poisonous fevers, such as scarlatina, diphtheria, and so forth. Dose: from five to twenty grains in water.

Soda, Muriate of (*Table Salt*).—Mild stimulant to the stomach in moderate doses; in larger it causes cathartic effects, and in still larger it acts as an emetic. It is only for this latter purpose that it is used as a medicine. Dose: one to two tablespoonfuls in a tumbler of water. It may be properly employed to excite vomiting in cases of narcotic poisoning, and in cholera, &c.

Soda, Phosphate of.—Cathartic, and resembles Epsom or Glauber salt in its general effects. Its taste is like that of common table salt, and it may be given in broth or soup, as it imparts to it the proper agreeable saline taste. Dose: half an ounce to an ounce and a half.

Soda, Sulphate of (*Glauber's Salt*).—An active cathartic, increasing very much the intestinal secretion. Dose: half an ounce to an ounce and a half, dissolved in water. A little cream of tartar added very much conceals its taste.

Spanish Flies (*Cantharides*).—Powerfully stimulant and diuretic. In large doses they produce violent irritation of the kidneys and bladder, strangury, and bloody urine. In still larger they will cause death from inflammation of the bowels. Irritation of the urinary organs may be relieved readily by an injection of laudanum, or the internal administration of laudanum or camphor, together with a free use of mucilaginous drinks. They are used internally in dropsy, suppressed menstruation, gleet, whites, and in the incontinence of urine consequent upon debility of the neck of the bladder. Dose: one or two grains, powdered, and made into pills, twice a day. Dose of the tincture, twenty drops to a teaspoonful three times a day, administered in two tablespoonfuls of mucilaginous fluid.

Spearmint (*Mentha Viridis*).—Carminative and antispasmodic. Dose of the *oil*, from five to fifteen drops on sugar.

Spermaceti (*Cetaceum*).—Chiefly used in ointments and cerates.

Spider's Web (*Tela*).—Sometimes given for nervous troubles. Dose: from three to five grains. It is a good remedy to stop bleeding from small cuts made by shaving.

Spikenard.—Diaphoretic and stimulant. Used for rheumatism and syphilis.

Spirit of Mindererus.—(See *Ammonia, Acetate of.*)

Sponge.—Burned sponge is used by some for scrofula, and diseases of the skin. Dose: one to four drachms.

Star Grass (*Aletris Farinosa*)—Tonic. Used in disorders of the womb. Dose of powder, from five to fifteen grains.

Spurred Rye.—(See *Ergot.*)

Squills (*Scilla Maritima*).—Expectorant, diuretic, and in larger doses emetic. Used in affections of the lungs after the stage of excitement has passed away; in dropsy, combined with calomel or digitalis; and in the croup of children, combined with seneca snake-root and tartar emetic. See *Prescriptions*, under the head of "*Expectorants*," for Coxe's Hive Syrup. Dose as a diuretic or expectorant is one grain, repeated three times a day.

Storax (*Styrax*).—Expectorant. Dose: from five to twenty grains.

Stramonium (*Datura Stramonium*).—Stramonium leaves contains an alkaloid (Daturia), which very closely resembles atropia. Its effects on the system very closely resemble those of hyoscyamus, but it appears to have a greater power of relaxing spasm. It is especially used in spasmodic asthma, very frequently by smoking. Extract (inspissated juice of leaves), dose: one to two grains. *Tincture: ten to twenty drops.*

Sulphate of Iron.—Astringent and tonic.

Sunflower (*Helianthus Annus*).—Diuretic and expectorant. Dose of oil, from five to twenty drops.

Sulphur.—Laxative and diaphoretic. Used in piles, diseases of the skin, especially itch, chronic rheumatism, catarrh, asthma, &c. It is often combined with cream of tartar. Dose: one to three drachms a day, mixed with syrup, molasses, or milk.

Sumach Berries.—Astringent and cooling. Used for making a cooling drink in fevers, and as a gargle in inflammation of the throat. Strongly recommended in mercurial salivation.

Sweet Flag (*Calamus*).—A stimulant, tonic, and aromatic. Used in dyspepsia and debility of the stomach and intestines. Dose: one scruple to one drachm. It may be taken in infusion, to be drank freely.

Sweet Fern (*Comptonia Asplenifolia*).—Tonic and astringent. Dose of decoction, from one to five ounces.

Sweet Spirits of Nitre.—Diaphoretic, diuretic, and stimulant. Used in fevers and diseases of the urinary organs. Dose: from twenty-five drops to three drachms.

Syrup of Iodide of Iron.—Much used for children. Dose for children, from five to fifteen drops in water.

Tag Alder (*Alnus Rubra*).—Popularly used in syphilis and diseases of the skin. Dose of the infusion, from one to three ounces.

Tamarinds.—A cooling laxative. They are often used for making a drink in diseases of excitement.

Tansy.—Aromatic and tonic. Used for worms, hysterics, &c. An ounce of tansy and a pint of hot water will make an infusion, a half a teacupful of which may be taken several times a day.

Tapioca.—The fecula of the large, fleshy root of the *Jatropha manihot*, or cassava plant of the West Indies. There are two varieties of the root—the bitter and the sweet. The former is poisonous, containing prussic acid; but this being driven off by heat, cooking renders it innocuous. The tapioca is obtained by expressing the juice and allowing it to deposit its fecula, which is afterwards dried by heat. Occurs in irregular, hard, white grains. Odorless, tasteless. Used as a farinaceous article of food. Prepared by prolonged boiling in milk or water, which converts it into a sort of jelly.

Tar.—Stimulant and diuretic. Used in chronic coughs. Tar-water has been thought a remedy for consumption. Tar is also used for piles. For the mode of preparing tar-water, see *Prescriptions*, under the head of "*Expectorants.*" The dose of tar is half a teaspoonful, three or four times a day. It may be made into pills with flour, or mixed with sugar.

Tartrate of Soda and Potash (*Rochelle Salts*).—Saline purgative. Used very much in rheumatism. Dose: from one drachm to half an ounce, largely diluted with water.

Tartrate of Iron and Potash.—Dose: from five to twenty-five grains, in solution.

Thorn Apple (*Jamestown Weed.* See *Stramonium.*)

Tragacanthus.—Used only as a vehicle. The foundation of the officinal troches.

Tulip Tree (*Wild Poplar*).—Diaphoretic and tonic. Used as a substitute for Peruvian bark in ague, in chronic rheumatism, and dyspepsia. Dose of bark in powder, half a drachm, three times or oftener in a day. A saturated tincture may be made, the dose of which will be a teaspoonful.

Turkey Corn (*Corydalis Formosa*).—Tonic and alterative. Dose of tincture, one to ten drachms.

Turpentine. (See *Oil of Turpentine.*)

Valerian.—Stimulant and antispasmodic. Used in hysterics, epilepsy, and low fevers in which there is great nervous disturbance. Dose of powder, from thirty to sixty grains. It is often administered in tincture, the dose of which is one to four teaspoonfuls. In some cases the quantity of spirit may be an objection to the use of the tincture, when an infusion may be employed in preference.

Valerianate of Iron.—Dose, from half a grain to two grains.

Vervain (*Verbena*).—A tonic and diaphoretic. Dose of the infusion, from one to five ounces.

Violets.—They are diuretic and slightly laxative, and have been used in diseases of the lungs, kidneys, and skin; and some of the varieties are thought to possess virtue in gravel complaints. They may be administered in the shape of an infusion, made by adding a pint of hot water to an ounce of the herb. Dose, two to four tablespoonfuls, three times a day.

Wafer Ash (*Wingseed*).—Used as a tonic for ague and debility. Dose of the infusion, from one to four tablespoonfuls.

White-Lead.—Used as a local desiccant and sedative.

WHITE OAK BARK (*Quercus Alba*).—Astringent. Rarely used internally, but as local application.

WILD CARROT.—A mild, stimulating diuretic. Used as adjuvant.

WILD CUCUMBER (*Elaterium*).—An active cathartic. Used in dropsy, in which disease it possesses great power. It causes copious watery motions, and unless given with care, may do much mischief by the violence of its action. Dose: half a grain, repeated once in an hour until it operates.

WILD CHERRY BARK (*Prunus Virginiana*).—Tonic and sedative. Used in consumption and dyspepsia, to increase the strength of the general system. It quiets the cough and calms the nerves.

WILLOW (*Silex*).—Tonic and astringent. Is used as a substitute for Peruvian bark in ague. *Salicin*, an active principle of willow bark, is getting into very general use, and by some is considered but little inferior to quinine. One ounce of the bark, infused in a pint of hot water for three hours, will make an infusion which may be drank during the intermission of the paroxysms. Dose of the salicin is from two to ten grains.

WINTER GREEN. (See *Pipsissewa.*)

WITCH HAZEL (*Hamamelis*).—Tonic, astringent. Used in diarrhœa and dysentery. Dose of the infusion, one to five drachms.

WORM SEED (*Jerusalem Oak*).—An excellent vermifuge. Dose for a child two or three years of age is one to two scruples of the seeds in powder, mixed in molasses, and given morning and evening for three days. A brisk cathartic should then be administered.

WORMWOOD (*Artemisia Absinthium*).—A strong tonic. Used in general debility, dyspepsia, in worms, ague, etc. The infusion is made by drawing an ounce of the tops in a pint of boiling water. Dose: two to four tablespoonfuls, three times a day or oftener.

YELLOW DOCK (*Rumex*).—Tonic, alterative. Dose: of fluid extract, one to two drachms; of syrup, quarter of an ounce to one ounce.

YELLOW ROOT.—A native shrub of the South and West. The bark of the root is intensely bitter. It is a tonic, and may be used in such cases as are suited to quassia or columbo. Dose: two scruples.

ZINC, OXIDE OF.—Tonic and antispasmodic. Used in epilepsy, St. Vitus's dance, and other spasmodic affections. Dose: two to eight grains, four times a day, made into pills.

ZINC, SULPHATE OF (*White Vitriol*).—Tonic, astringent, and, in large doses, emetic. It is chiefly employed in epilepsy, whooping-cough, and other spasmodic diseases. It is seldom used as an emetic, except in poisoning. It causes vomiting very quickly. Dose: as a tonic, one to two grains: as an emetic, twenty to thirty.

ZINC, VALERIANATE OF.—Tonic and antispasmodic. Dose: one to two grains.

GLOSSARY.

EXPLANATION OF MEDICAL TERMS.

This list includes many terms that have not been explained in the course of the book.

Abdomen. The belly, or the lower part of the body below the diaphragm.

Ablution. Washing the body.

Abortion. Birth of a child before the proper time.

Absorbent. A vessel which absorbs or sucks or takes up fluid.

Accoucheur. A man who attends women in childbirth.

Acid. Sour, biting.

Acrid. Pungent, sharp to the taste.

Actual Cautery. Burning or searing with a hot iron. Used in surgery.

Acupuncture. Pricking with needles. One of the operations of surgery.

Acute. Acute diseases are of short duration and have severe symptoms. The reverse of *chronic*.

Adhesive. Tenacious.

Adhesive Plaster. Sticking-plaster.

Adipose Tissue. Fat.

Adult Age. A grown person.

Affection. Disease.

Albumen. An animal substance that coagulates when heated. The white of an egg is albumen.

Albuminose. A substance produced in the stomach during digestion.

Alimentary Canal. The tube by which aliments are conveyed through the body. It is composed of the mouth, pharynx, œsophagus, stomach, and intestines.

Alkali. A substance which, when united to acids, neutralizes them. Potash, soda, etc., are alkalies.

Alterative. A remedy which slowly changes the condition of the system.

Alvine. Relating to the intestines.

Amaurosis. A loss or decay of sight, produced by various causes.

Amputation. Cutting off a limb or other part of the body.

Anæmia. Poverty of blood.

Anæsthesia. Numbness, or paralysis of sensation.

Anasarca. A general dropsy of the body, all over.

Anastomose. To communicate the arteries and veins.

Anatomy. Study of the structure of the body.

Anodyne. A remedy that relieves pain, calms the nerves, and induces sleep.

Antacid. A substance that neutralizes acids. Alkalies are antacids.

Anthelmintic. A medicine that destroys worms.

Antibilious. That cures "biliousness."

Antidote. A specific protective against poison or any disease.

Antiscorbutic. A remedy used for the scurvy.

Antispasmodic. Medicines which relieve cramps, spasms, and convulsions.

Aperient. A mild purgative or *laxative*.

APEX. The summit or top.

APPARATUS. Collective organs which are associated in performing the same function.

AROMA. Agreeable odor of plants and other substances.

AROMATIC. A fragrant, spicy medicine.

ARTERY. A vessel that conveys the blood from the heart to the organs.

ASCARIDES. Pin-worms or thread-worms found in the lower portion of the bowels.

ASSIMILATION. The process by which the food is changed into tissue.

ASTHENIC. Debilitated.

ATROPHY. A wasting away.

BRIGHT'S DISEASE. A serious disease of the kidneys.

BRONCHIAL. Pertaining to the branches of the windpipe in the lungs.

BOUGIE. An instrument used to dilate the urethra.

CACHEXY. A bad state of the body. It may be caused by blood poisons.

CALCULI. Gravel and stone formed in the kidneys and bladder.

CALLOUS. Indurated, hardened.

CALORIC. Heat.

CAPILLARY. Like a hair. A small tube connecting the arteries and the veins.

CARBONIC ACID GAS. A gas of two parts of oxygen and one part of carbon. It is found in respiration.

CARMINATIVE. A medicine which relieves colicky pains by preventing the formation of wind in the stomach and bowels.

CARTILAGE. A hard elastic substance of the body; gristle.

CATAMENIA. Monthly discharges of females.

CATAPLASM. A poultice.

CATHETER. A curved instrument introduced into the bladder through the urethra for drawing off the urine.

CELL. A small elementary form found in vegetable and animal tissue.

CEREBELLUM. The lower and back part of the brain.

CEREBRUM. The upper and front part of the brain.

CEREBRO-SPINAL. Pertaining to the brain and spinal cord.

CHANCRE. A venereal sore.

CHORDEE. A painful drawing up of the penis. It occurs in gonorrhœa.

CHRONIC. The opposite of acute. A disease that lasts for a long time and becomes a fixed condition of the body is called *chronic*.

CICATRIX. A scar that remains after a wound.

CLAVICLE. Collar-bone.

CLYSTER. An injection.

COAGULATION. Becoming hard in a peculiar manner. Albumen coagulates.

COLLIQUATIVE. Excessive discharges from the body which weaken the system.

COLOSTRUM. The earliest secretion of milk.

COMA. Stupor.

CONFLUENT. Running together.

CONGENITAL. From birth, or born with.

CONGESTION. Settling of blood in any part.

CONJUNCTIVA. The membrane which lines the eyelid and covers the eye.

CONTAGIOUS. That may be communicated by contact; catching.

CONVALESCENT. Recovering after sickness.

CONVULSION. Involuntary and violent movement of the body.

CORDIAL. A medicine that mildly stimulates and raises the spirit.

CORPSE. The dead body of a human being.

CORROSIVE. Eating or consuming.

COUNTER-IRRITATION. Drawing disease from one part by irritating another part

CRANIUM (krā-ni-um). The skull.

CUTANEOUS. Pertaining to the skin, as cutaneous diseases.

CUTICLE. Outer skin.

Diluent. That which reduces the strength of *liqui*
Diuretic. A medicine which promotes the flow of
Dyspnœa. Difficulty of breathing.
Drastic. Powerful, as drastic cathartics.

Electrization. Medical use of the electric currents
Electuary. Medicines mixed with syrup or honey.
Emaciation. Wasting away of the flesh.
Emesis. Vomiting.
Emmenagogue. A medicine which aids the menstru
Emulsion. A mixture; as oil and water mixed wit
Enamel. Hard covering of the teeth.
Enema. An injection.
Entozoa. Worms in any part of an animal body.
Epidemic. A disease that prevails.
Epithelium. Layer of cells covering membranes.
Epigastric. Region of the stomach.
Eructation. Belching; gulping of wind from the s
Eruption. Breaking out on the skin.
Eustachian Tube. A narrow canal that connec throat.
Exacerbation. Increase of severity in a disease.
Excoriate. To abrade the skin.
Excretion. Effete or worn matter thrown off fro ration, fæces, &c.
Expectorant. A medicine which aids the discharg chial tubes or lungs.

Fæces. The discharges from the bowels.
Faradaization. Use of the Faradaic current.
Fauces. Back part of the mouth.
Febrile. Feverish.
Fetid. Having a disagreeable smell.
Fœtus. The child in the womb.
Fibrine. Animal matter found in the blood.
Filter. A strainer.
Fistula. A narrow ulcerous opening.
Flaccid. Weak, soft.
Flux. An unusual discharge from the bowels.
Function. The work or office performed by any par
Fundament. The seat.

Hepatic (he-pat'-ic). Relating to the liver.
Hereditary. Coming down from ancestors.
Hernia (her'nia). A rupture.
Hydragogue. A purgative that produces a watery discharge from the bowels.
Hyperæsthesia. Excessive and abnormal sensibility.
Hygiene. The art of preserving and regaining health by obedience to the laws of health.
Hypodermic. Under the skin.
Hysterical. Nervous, subject to hysteria.

Infection. Communication of disease.
Infusion. Medicine made by steeping in cold or hot water.
Injection. Liquid sent into some part of the body by means of a syringe.
Inspiration. Drawing air into the lungs.
Integument. The skin.
Intermittent. Subject to intervals.

Laxative. A mild purge; a medicine that loosens the bowels, but does not cause profuse discharges.
Ligature. A thread, a tie.
Liniment. A medicated lotion or wash.
Lumbago. Rheumatic pains in the loins and small of the back.

Maceration. Softening with water.
Malaria. Air which causes disease. Ague is caused by malaria.
Marrow. A soft substance in the bones.
Medulla Oblongata. A nervous mass in the lower part of the brain.
Metastasis. A change of disease from one part of the body to another.
Miasma. Malaria; exhalations from a decaying matter.
Morbid. Diseased.
Mucilage. Viscid fluid substance.
Mucus. The ropy, lubricating, tenacious fluid secreted by the mucous membrane.

Narcotic. A medicine that causes sleep, relieves pain, or stupefies.
Nausea. Sickness at the stomach, with a desire to vomit.
Nitrogen. A gas that forms four-fifths of the atmosphere.
Nervine. A medicine that acts on the nerves.
Neuralgia. Pain of a nerve, without apparent inflammation.
Neurasthenia. Nervous exhaustion.
Normal (nor'mal). Natural.
Nutritious. Nourishing.

Oblong. Longer than broad.
Olfactory Nerves. The nerves of smell.
Oxygen. A gas that forms one-fifth of the atmosphere.

Palpitation. A sensible beating of the heart, sometimes violent and painful.
Panacea. A medicine that cures everything.
Paralysis. Palsy; loss of the power of motion or sensation of any part of the body.
Paraplegia. Paralysis of the lower limbs.
Paroxysm. A fit; a sudden increase in violence of a disease.
Pectoral. Medicines given for diseases of the chest.
Pepsine. An important element of the gastric juice.
Perspiration. Sweat.
Periosteum. Membrane covering the bone.
Petechiæ. Spots on the skin in fever.
Pleura (plew'ra). A membrane that lines the inside of the chest and covers the lungs.
Pleurisy. Inflammation of the pleura.

Pneumonia. Inflammation of the substance of the lungs.
Polypus. A pear-shaped tumor.
Prognosis. Foretelling the issue of a disease.
Purgative. A medicine that opens the bowels.
Purulent, Consisting of pus.
Pus. The yellowish whitish matter in sores, wounds, ulcers.

Rectum. The end of the large intestines.
Respiration. The process of breathing.
Rubefacient. Application that causes redness of the skin.

Saccharine. Consisting of sugar, sugary.
Salivation. Increase of the secretion of saliva.
Scirrhous. Hard.
Scorbutic. Partaking of the character of scurvy.
Scrotum. The bag containing the testicles.
Secretion. Separation of any substance from the blood for a special purpose.
Sedentary. Sitting, inactive.
Seminal Emissions. Emission of semen.
Serous. Watery.
Sinapism A mustard plaster.
Sialagogue. Medicine that makes the saliva flow.
Spinal Column. The backbone.
Spinal Cord. The nervous marrow in the spinal column.
Stimulant. A medicine that excites.
Stertorous. Snoring.
Stool. Discharge from the bowels.
Subcutaneous. Under the skin.
Sudorific. A medicine that causes sweating.
Suture. Jagged edges that unite the bones of the skull.
Syncope. A fainting-fit.
Syringe. An instrument for injecting liquids into the bowels, throat, ear, vagina or other cavities of the body.

Tendon. A cord that connects a muscle with bone.
Tenesmus. Painful bearing-down sensation in the lower bowel.
Tepid. Warm, but not hot.
Tertian. Occurring every other day.
Tibia. The large bone of the leg below the knee.
Tincture. Medicine dissolved in alcohol.
Tonics. Remedies which give strength and tone to the system.
Trachea. Windpipe.
Typhoid. Like typhus; low, weak, debilitated.

Urinary. Relating to urine.
Urea. A substance found in the urine.
Urethra. The canal of the penis through which the urine passes from the body.
Uterus. The womb.

Vagina. The canal that connects the vulva with the womb.
Vaginismus. Spasm of the vagina, caused by morbid irritability.
Varioloid. A mild form of small-pox.
Venery. Sexual intercourse.
Vertigo. Dizziness.
Vesicant. That which raises a blister on skin.
Virus. Poisonous and contagious matter.
Viscera. Internal organs of the body.

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Nathan Allen.

The NEW ORLEANS DAILY PICAYUNE, Nov. 14, says:—The Doctor in the Family.—It is no exaggeration to say that America spends more money on doctors and medicine—regular and quack—than four times its population in Europeans. Much of this is owing to our ignorance of the laws of health, and of what we may term the rudiments of medicine and surgery—not knowing how to use the family medicine-chest. In our ancestral homes the mother or grandmother commonly rears the whole brood of offspring, from infancy to puberty, without once calling in the medico; but with us, if Jackey makes too free with the preserves, Old Bolus must be sent for. Consequence of our practice in this respect—dyspepsia, diseased liver, decayed teeth, and that fiend's grip, rheumatism. We would remedy this by placing in every household a treatise on hygiene and medicine, written in the popular style, with plain, untechnical descriptions of bodily ailments and prescriptions easy of application, all based upon the latest discoveries in medical science. Such a work (and something more) is "Our Home Physician," by Dr. George M. Beard, of New York. It is a monument of research and learning, intelligent construction and mastery of detail. There is no ill that flesh is heir to that is not plainly described in its pages, and its appropriate treatment described when it is not a case for the doctor; for the work does not pretend to take the place of the physician in all cases. "Our Home Physician" is a treatise upon the art of preserving health as well as upon how to restore it when impaired; and if only for its chapters on hygiene, we would desire to see a copy of the work in every household, especially in the rural districts. As we but recently described in this column its several features, we will only add here that it is in itself an epitome of medical science, commended to us by some of the leading physicians and medical periodicals of the day.

The NEW YORK WEEKLY DAY-BOOK says:—Our Home Physician.—Dr. George M. Beard, member of the New York Medical Society, has done humanity in general, and the heads of families especially, a most essential service, in presenting to them this new "Guide to the Art of Preserving Health and Treating Disease," under the name of "Our Home Physician." While we are ready to concede that the experienced practitioner and skilled medical professor should always be called upon in cases of grave emergency, we nevertheless hold to the idea that "a little knowledge" of the laws, medical and surgical, by the guiding minds of every household, is not "a dangerous thing;" for, judiciously and properly applied, this little knowledge may often ward off a serious domestic calamity, perhaps be the means of saving life, in the absence of a professional medical adviser at the very critical moment his presence is necessary. A thorough review of this very valuable work, or even a fair illustration of its vast contents, it would be impossible to give in an ordinary notice like this. It is a book of over one thousand pages, every line of which conveys hygienic principles that can be practically applied by those who are for the moment beyond the reach of the consulting physician. More than this, the work lucidly explains the laws of health, which, followed, precludes the necessity for this leaning upon the family medical adviser with that degree of helplessness so painfully manifest in certain families, and so often taken advantage of by quacks and charlatans. So profoundly impressed, however, are the medical faculty of the great practical value of Dr. Beard's work, that testimonials appear endorsing it from a large number of the leading members of the profession. The work seems to cover the entire field. There appears no one department of remedial agents in the lines of medicine or surgery untouched upon. The book is a complete library in itself, and presents its advice and lays down rules of action so plainly that the narrowest comprehension cannot fail to grasp and understandingly apply the principles made known. Every head of a family should purchase this admirable Guide to Health.

G. DOWELL, M.D., Professor of Surgery in the Galveston (Texas) Medical College, says, in the GALVESTON MEDICAL JOURNAL:—Our Home Physician, by Dr. George M. Beard, A.M., M.D.—This is, so far as we have examined it, a good work for the non-professional. The author is an able man and has given us a book, and one up to the times—useful to all, but especially the presidents of schools, academies, and captains of ships, etc., where they are thrown on their own resources. The matter it contains is perfectly reliable and far superior to Gunn's "Domestic Medicine," or any similar work. It is numerously illustrated and "*based on the most recent and highest authorities in the several departments, and brought down to the latest dates.*"

The NEW ORLEANS DAILY BEE says:—Medical Guide for the Family.—We are in receipt of advance sheets of an exceedingly valuable work, entitled "Our Home Physician," by George M. Beard, A.M., M.D., of New York, lecturer on nervous diseases in the University of that city. The work is highly spoken of. The style is familiar, and the directions easily understood.

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